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June 1998

Dear Reader:

Enclosed is your copy of the Record of Decision (ROD) for the Golden Sunlight Mine Permit Amendments 008 and 010. The decision has been made to approve Golden Sunlight's proposal and modify it with the addition of the Return Diversion and No Pit Pond alternatives.

The ROD contains a list of stipulations that will be applied to the permit in order to implement the amendments. Also included in the ROD is the agencies' rationale for their decision and information on appealing the decision.

We wish to thank everyone who participated in the EIS process. If you need additional copies of the ROD, the Final EIS, or the Final EIS Executive Summary, please contact either David Williams (BLM) at 406-494-5059 or Greg Hallsten (MDEQ) at 406-444-3276.

Mark A. Simonich, Director
State of Montana
Department of Environmental Quality

Merle Good, Area Manager
Bureau of Land Management
Headwaters Resource Area

ITEM HAS BEEN DIGITIZED

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MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting & Compliance Division
and
UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management - Headwaters Resource Area

RECORD OF DECISION
for
Proposed Mine Expansion
Golden Sunlight Mine Permit Amendments 008 and 010
to Operating Permit 00065
Jefferson County, Montana
June 29, 1998

I. INTRODUCTION AND BACKGROUND

Golden Sunlight Mines, Inc. (GSM) mines and processes gold-bearing ore on public and private lands about 5 miles northeast of Whitehall, Montana. Modern mining within this historic mining district began in the 1970s with exploration and predevelopment activities culminating in GSM receiving Operating Permit No. 00065 on June 27, 1975. An environmental impact statement (EIS) was prepared in 1981 for a major expansion of the mine that led to construction of the open pit, mill, Tailing Impoundment No. 1, and a cyanide vat leach facility. The operating permit has been revised and amended numerous times since.

In 1988, GSM applied to the Montana Department of State Lands (MDSL), now the Montana Department of Environmental Quality (MDEQ), and the Bureau of Land Management (BLM) for Amendment 008 to its operating permit. A mitigated environmental assessment (EA) was prepared to evaluate the impacts of this major expansion. After issuance of the decision for the application in 1990, GSM proceeded with its plans to expand the pit and waste rock dumps and construct Tailing Impoundment No. 2.

An appeal of BLM's approval of Amendment 008 was filed in 1990 with the U.S. Department of the Interior Board of Land Appeals (IBLA) by several environmental groups. The appeal alleged that BLM did not comply with several federal laws including the National Environmental Policy Act (NEPA), the Endangered Species Act, and the Migratory Bird Treaty Act. IBLA ruled largely in BLM's favor but requested that BLM review bonding for the possible reconstruction of several reclamation test sites. MDSL and BLM subsequently required an additional bond of $443,000.

Subsequently an appeal of MDSL's approval of Amendment 008 was filed in Montana District Court in 1992. In 1994, the court ruled on the issues. Among its findings were that MDSL could not rely on mitigation measures that were not evaluated in the EA, and that it was improper to

ITEM HAS BEEN DIGITIZED

approve Amendment 008 based on the 31 stipulations listed in the decision. Further, the court ordered preparation of an EIS for Amendment 008 but allowed mining to continue in the meantime.

Ground movement at the mine in mid-1994 caused GSM to cease operations for several months until the cause of the movement could be determined and remediation measures developed. Fifteen million tons of waste rock were moved to relieve pressure on the ground movement block and to buttress the block against further movement. Ground instability reduced the amount of space available for waste rock placement under Amendment 008. Since 1994, GSM has continued to operate under Amendment 008 and the "Interim Dump Plan" (Amendment 009) which allows dumping of waste rock on alternative areas within the existing permit area.

In 1995, GSM applied to mine additional ore by enlarging and deepening the pit. The proposal includes expansion of the permit area to provide additional space for waste rock generated under Amendment 008, that is presently approved for removal, as well as for waste rock that would be generated if the expansion is approved. The Draft and Final EISs examine the impacts of Amendment 008 and the proposed expansion, and related alternatives.

The agencies (MDEQ and BLM) must decide whether to permit the proposed mine expansion. If the expansion is approved, the agencies must decide which alternative to permit and what mitigation measures to impose on the operating permit to reduce environmental impacts. If the expansion is not approved, the agencies must determine whether additional mitigation measures need to be imposed on Amendment 008 of the existing operating permit. The agencies' decisions are documented below.

II. DECISIONS

After considering the proposal, issues, alternatives, potential impacts, and management constraints, the agencies have selected the Preferred Alternative as identified in the draft and final EISs. The Proposed Action as modified by the Return Diversion and No Pit Pond alternatives as documented in this record of decision (ROD) are approved for implementation as described in this record. This decision approves, with modification, the mine expansion as proposed but requires that Sheep Rock Creek be diverted around the East Waste Rock Dump, instead of into the Conrow Creek drainage, and requires that the pit be kept dry after the end of mine life instead of being allowed to fill with water. This decision also reaffirms MDEQ's previous decision for Amendment 008 based on additional analysis.

As a part of this decision, the MDEQ has designated a groundwater mixing zone as described and evaluated in Appendix B of the draft EIS and in Appendix 1 in the final EIS. This mixing zone establishes compliance points for GSM where groundwater standards must be met in order to ensure continued maintenance of groundwater quality for beneficial uses.

Mitigation measures to reduce environmental impacts and to improve the potential for long-term

reclamation success will be stipulated in Amendment 010 to the operating permit before this decision can be implemented by GSM. This approval is made by MDEQ under the Metal Mine Reclamation Act (MMRA) and by BLM under the Federal Land Policy and Management Act (FLPMA). The Proposed Action and the Return Diversion and No Pit Pond alternatives are described in detail in Chapter II of the EIS.

In addition to approving Amendment 010 to the operating plan, MDEQ extends, for the tailing impoundments, the standard 2-year reclamation period required by MMRA. Since tailing consolidation will take 8 to 10 years, final reclamation of the tailing impoundments must be completed within 2 years after the tailings have completely consolidated.

III. AMENDMENT NO. 008 STIPULATIONS

The following stipulations (in italics) were placed on Amendment 008 in 1990. The mitigation measure identified in the EIS (at the end of Chapter IV) is noted and the rationale for each stipulation follows. An update on GSM's implementation of the stipulation since it was required in 1990 is then provided. Information regarding applicable conclusions in the EIS is then included with a recommendation regarding future implementation of each stipulation.

Where stipulations have been incorporated as commitments into Golden Sunlight's operating plan for Amendment 010, those commitments are enforceable under MMRA. Thus, the stipulations under Amendment 008 have become redundant and do not need to be retained to ensure enforceability.

Where stipulations required a discrete definable one-time action (such as submittal of a specific design) that activity has usually been completed and the EIS analysis did not recommend further modification. In this case, compliance is complete and the stipulation is no longer applicable. Thus the agency decision is to delete the requirement. Where the EIS recommends design modifications, the Amendment 008 stipulations are superseded by an Amendment 010 requirement and thus can also be deleted. Each stipulation number has been preceded with "008" or " 010" to clearly denote which amendment the stipulation is based on. When these scenarios are applicable, they are documented in the following discussion. In addition, each discussion references specific mitigation measures identified in Chapter IV, Subchapter P of the EIS.

Waste Rock Dump Stipulations

Stipulation 008-01 *All portions of waste rock dumps not needed for vehicular traffic and not proposed for future slope reduction must be reclaimed concurrent with ongoing activities.*

Rationale: This commitment was not clearly contained in GSM's application for Amendment 008 and is required by MMRA under 82-4-336(1).

GSM has performed concurrent reclamation in areas that will not be redisturbed by future mine or

reclamation activity. Map AR-97-1 of the 1997 Annual Report shows all areas which have been or are in the process of being reclaimed. These efforts are summarized in the Mine Area Reclamation of Section 1.0 of the 1997 Annual Report. To date, over 203 acres have been reclaimed.

The pit limits for stages IV and V are the same above the 6200 elevation on the north wall, and above the 5850 elevation on the south wall. GSM utilized a number of unoxidized slopes and dump tops for site-specific reclamation research in these areas because mining has been completed. Monitoring data collected from these areas, along with data from the northwest and high-grade rock dump test sites, have allowed GSM to confirm equipment performance.

Completed and in-progress mine area test reclamation as of year-end 1997 are detailed in Section 1.0 of the 1997 Annual Report. Reclamation will be somewhat limited in the near future, as most of the unreclaimed existing dump surfaces will be disturbed by continued mining activity. However, GSM will continue concurrent reclamation whenever possible. A discussion of dump decommissioning and reclamation scheduling is given in the response to Stipulation 008-9 in this section. GSM has committed to concurrent reclamation, required by this Amendment 008 stipulation, in Section 5.12.1 of its application for the proposed expansion. This stipulation was successful in instituting concurrent reclamation at the Golden Sunlight Mine project area. Concurrent reclamation has been initiated onsite and the commitment to future concurrent reclamation is outlined in both the existing and proposed reclamation plans. Therefore this stipulation to Amendment 008 is redundant with GSM's operating plan and is no longer needed.

Stipulation 008-2 *Research and monitoring plans must be developed, in consultation with the MDSL and the BLM, in order to determine the effectiveness of the waste rock dump top reclamation described in Stipulation 008-1. The research and monitoring plan must include consideration of parameters that affect oxidation of pyrite and particularly acid drainage from the waste rock dumps. This plan must include and evaluate water balance, taking into consideration the effect of the rock cap and soil layers and the movement of water and oxygen into the reclaimed waste rock dumps. These plans must be submitted for final approval with the Annual Report to be submitted June 27, 1991, hereinafter referred to as the 1991 Annual Report.*

Rationale: This research and monitoring was required under Amendment 008 to evaluate and document the effectiveness of site-specific reclamation plans and requirements. The designs of reclamation plans and requirements and research plots were based on previously published studies and experience at Montana mines and others. Research was intended to allow GSM and the agencies to improve upon site-specific adaptations of this information. The monitoring was required to enable the agencies and GSM to detect any unanticipated problems in a timely fashion, allowing for the establishment of additional mitigations.

Research and monitoring plans to determine the effectiveness of waste rock dump top reclamation have been developed and implemented in consultation with MDEQ and BLM. As originally described in the June 1, 1990 to May 31, 1991 Annual Report submitted in June 1991, the reclamation research on the high-grade rock dump include a reclaimed dump top plot. This plot

was evaluated for all of the parameters listed in this stipulation including infiltration, acidification, and water balance development. A description of the plots and monitoring plan was given in the Mine Area Reclamation Section of Chapter II and also Appendix H of the 1991 Annual Report submitted in March 1992. A monitoring report is given in Appendix AR-93-L of the 1993 Annual Report and in subsequent annual reports.

Waste rock dump top reclamation is also being evaluated for all the parameters listed above on the 6300 NW dump top reclamation test plot. An outline of this plan was given in Appendix I of the 1991 Annual Report submitted in March 1992. A monitoring report can be found in Appendix AR-93-L of the 1993 Annual Report. A final summary report on all rock dump research was given in Appendix 5.5-1, 5.5-2, and 5.6-2 of GSM's 1995 Operating Permit Amendment Application. Followup reports were submitted in the 1995, 1996, and 1997 Annual Reports. Reclamation plots were designed and analyzed according to agency parameters required above.

Through 1994, sedimentation rates on the test plots were statistically comparable to natural rates from reference areas, with all rates under a tolerance level of 2.0 tons per acre per year. Similarly, vegetation cover was measured on 2H:1V slopes and found to have exceeded that of reference areas and to have surpassed the vegetation success criteria established for this project. Adjunct modeling using the Revised Universal Soil Loss Equation (RUSLE) as part of the EIS analysis showed that erosion could be held to acceptable levels on slopes up to 2H:1V if soils with appropriate characteristics are reapplied to the slope surface. Additionally, three separate modeling approaches were used to provide an estimated water balance within the waste rock dumps (HELP; SOILCOVER; and an in-house model by Schafer and Associates, Inc.).

These test plot studies and modeling results demonstrate that 2H:1V slopes can be successfully revegetated using the proposed steep slope reclamation techniques developed for this project (capping, contour benching, dozer gouging, mulching, intensive material sampling, etc.), and that infiltration through the reclaimed waste rock dump surface will be limited to 0.25 to 0.5 inch per year. The oxidation of pyrite is still expected to occur within the waste rock dumps, but the amount of moisture penetrating through the reclamation cap and migrating through the interior of the waste dumps is expected to be minimized by the design of the reclamation cap. To avoid long-term impacts to groundwater quality, a long-term groundwater monitoring and treatment plan has been developed and is described in the final EIS.

The reclamation research and monitoring plans for the waste rock dumps were approved by the agencies in 1991 and 1992 as part of the annual report reviews. Thus the requirements of this stipulation have been fulfilled and are no longer needed. In addition, the agencies stipulated continued monitoring of the test plots as part of mitigations S-1(see Stipulation 010-14) and S-6 (see Stipulation 010-17).

Stipulation 008-3 *GSM must construct drainage or seepage control structures in the foundation beneath the waste rock dumps, made of calcareous subsoils and constructed on the contours of the slopes. As-builts must be submitted with the annual reports.*

Rationale: This stipulation to Amendment 008 was required to provide an additional source of neutralization for potential ARD seeping from beneath the dumps. It is evaluated in the final EIS on pages 248-250.

Retention berm construction at the toe of the waste dumps has been completed concurrent with soil stripping. These berms (seepage control structures) serve two functions. First, they control seepage by retaining moisture should any water penetrate the dumps, thus promoting infiltration into subsoils. Second, the berms catch any rolling waste dump rocks and protect soils that have not yet been stripped.

Berms are constructed of *in-situ* calcareous subsoils where available. Where possible, they are constructed on contour; however, much of the dump terrain to date has been too steep to allow contour berming. In steep areas, large berms are constructed across the natural drainages. Retention berms have been constructed by dozers and scrapers to a minimal height of 6 feet.

As-built designs have been submitted in the annual reports. These berms are designed to control seepage by capturing seepage at the toe of the waste rock dumps and promoting the infiltration of seepage into subsoils. With the exception of the pre-existing Midas Spring and Sunlight Spring, no seepage has been documented at the toe of the waste rock dumps to date. The design of these structures should be sufficient to control infiltration through the waste rock dumps that could seep from the toe of the dumps. Any seepage reporting to the berms will contact colluvial materials and flow a very short distance before infiltrating the colluvium.

As evaluated in the final EIS, the soils on the east side of the Bull Mountains will provide substantial neutralization of eventual seepage from the waste rock dumps. However, the soils on the west side of the mountains lack the neutralization capacity. As a result, mitigation W-4 (see Stipulation 010-7) was added to the EIS to address the limitations in neutralization capacity on the west side. GSM has not made specific commitments in the Amendment 010 application to continue this berm program. The agencies feel the berms are still needed and will require the Stipulation 008-3 remain in full force and effect.

Stipulation 008-4 *GSM must design and construct an engineered diversion capable of handling a 100-year, 24-hour precipitation event around the tops of the reclaimed dumps and off the tops of the reclaimed dumps. Diversion designs must be submitted with the 1991 Annual Report. As-builts must be submitted with the annual report submitted following construction.*

Rationale: This stipulation for Amendment 008 was required to minimize the infiltration of precipitation into the dumps and to minimize erosion on dump slopes.

The design of the diversion channel system to direct surface storm water runoff around and off of the tops of the reclaimed waste dumps was described under the response to Stipulation 008-4 in Chapter VII of the annual report submitted in March 1992. This design was approved by the

agencies as part of the 1991 Annual Report review. Implementation of the design will take place during final reclamation of each waste rock dump. Therefore this stipulation is fulfilled and is no longer needed.

The EIS analysis indicates that diversion of stormwater is appropriate. GSM has committed to a stormwater diversion system in Section 4.7.3 of the Amendment 010 application. However, the design needs to be modified to account for the Return Diversion Alternative (Stipulation 010-5) selected in the preferred alternative and the 100-foot benches in Stipulation 010-18 from Mitigation Measure S-7 in the final EIS. Therefore, Stipulation 008-4 is no longer needed.

Stipulation 008-5 *GSM must evaluate and report the acid-producing-potential characteristics of the waste rock dump surface after slope reduction. A sampling density must be developed from waste rock dump test plots to be initiated in 1990-1991. GSM must layer or incorporate lime amendments (such as limestone), if necessary, on or into the waste rock dump surface, basing the amount needed on the neutralization requirements of the top 0.5 feet of waste rock, and basing the method of layering or incorporation on field testing initiated in 1990-1991.*

Rationale: GSM was required to monitor reclamation surfaces under Amendment 008 in order to ensure unanticipated impacts did not occur. Monitoring ensures that the agencies and GSM can respond rapidly to mitigate such impacts.

Composite samples are collected for potential acidity from the slopes and dump tops after reduction as described in the reclamation plan given in GSM's Operating Permit. The number of samples will be determined by the variability of the dump material. Samples will be submitted for either the modified Sobek method of acid-base accounting, or an on site hydrogen peroxide lime requirement test which was described in Appendix E of the annual report submitted in March 1992. If the hydrogen peroxide method is used, then one sample in fifty will be verified with the modified Sobek ABA method.

If the samples identify lime requirements of less than 20 tons lime per 1,000 tons material and/or a net acid generation (NAG) pH of >3.2, the dump will be treated as an oxidized cap. Otherwise, the dump will be capped with oxidized rock. GSM has conducted field-testing to determine if lime incorporation is necessary. Based on the monitoring results the agencies have concluded that it would be more advantageous to replace the lime with 6 more inches of oxide cap rock. The northwest dump test plots which compare limed to unlimed slopes were fully described in Appendix I of the annual report submitted in March 1992. A final summary report on all rock dump research was given in Appendices 5.5-1, 5.5-2, and 5.5-6 of GSM's 1995 Operating Permit Amendment Application.

This waste rock dump surface sampling and analysis program appears to offer a reliable means of testing the success of capping efforts and of assessing the acid-producing potential of material

within the root zone. Media sampling intensity and analysis methods conform to, or exceed, acceptable standards or have been developed specifically to address site conditions. Parameter analysis values selected to indicate that a mitigation action (such as lime amendments) be taken are within acceptable limits. To date, the sampling and analysis methodologies have contributed to an acceptable level of revegetation success at the Golden Sunlight Mine site.

Analysis in the Draft EIS, Section IV.C.1, page 303, supports the use of this stipulation. GSM has committed in its application for Amendment 010 to continued sampling and reporting. Reports, under this commitment, will continue to be submitted as a part of GSM's Annual Report. Because of the commitment, this stipulation has become redundant with the permit and is no longer needed.

Stipulation 008-6 *GSM must evaluate and report the acid-producing-potential characteristics and lime requirements of the oxidized waste rock cap during placement. The sampling density, the amounts of lime needed, and the method of incorporation of lime (to neutralize the acid-production potential) must be based on field testing initiated on the oxidized waste rock that is used on the dump test plots in 1990-1991.*

Rationale: This stipulation to Amendment 008 was required to provide site-specific documentation that liming proposed under Amendment 008 was adequate, to evaluate the site-specific merits of other alternatives and to ensure the most effective methods were utilized.

GSM's test plots have helped determine the amount of lime needed for oxide capping. GSM will lime all cap rock to neutrality until data indicate the optimal site-specific liming criteria to be used. Therefore, GSM will continue to evaluate the use of marginal quality, potentially acidic, cap rock. GSM began kinetic testing of cap rock materials with acid-base account values in the 0 to -20 range in 1992 and continued testing in 1993, as described in Appendix AR-93-K of the 1993 Annual Report. A final summary report on all rock dump research was given in Appendices 5.5-1. 5.5-2 and 5.6 -2 of GSM's 1995 Operating Permit Amendment Application.

The sampling and liming plan is a part of GSM's existing operating plan. Samples collected to date are summarized in annual reports. The oxidized rock planned for use as capping material will be sampled for potential acidity prior to placement. Variability of material will determine sample number. If this oxidized rock has lime requirements of 0 or more tons lime per 1,000 tons material, it will be limed to neutrality. Therefore, GSM will lime all oxide rock capping material with lime rates of 0 to 20 tons of lime per 1,000 tons of capping material until GSM can justify an alternative plan based on kinetic or test plot data which are acceptable to the agencies. When determining lime rates, correction factors will be used to account for improper mixing and coarseness of lime.

After the oxidized rock cap is in place, a grid with 100-foot by 100-foot spacing will be re-

established on the slope. The grid will be used for depth control points and samples will be collected at each point. The samples will be visually examined, and representative samples analyzed for potential acidity. If potentially acidic areas are identified, more samples will be submitted. Those areas, where more than one sample has identified the need for lime rates greater than 0 tons of lime per 1,000 tons of capping material, will either be top dressed with enough lime to neutralize the cap, or recapped with suitable oxidized rock.

As noted for Stipulation 008-5, the waste rock dump surface sampling and analysis program developed by GSM appears to offer a reliable means of assessing the acid-producing potential of material proposed for use as a rock cap. Rock cap material sampling intensity and analysis methods conform to acceptable standards.

The Draft EIS analysis shows that oxide cap rock has limited liming requirements as discussed on page 303. Therefore the agencies have concluded that use of lime and continued evaluation are appropriate. GSM committed to continued sampling, reporting, and use of lime in its application in Section 5.2. Therefore this stipulation has become redundant with the operating plan commitments and is no longer needed.

Stipulation 008-7 *GSM must sample soil after placement on recontoured waste rock dumps. The sampling density and parameters to be measured must be determined in consultation with the agencies. The purpose of the sampling is to identify physical or chemical limitations inherent in the soils, which must be minimized, and to identify areas where more extensive erosion control measures may be needed to minimize surface soil loss or mass slippage of soils on slopes.*

Rationale: Soils are inherently variable. This stipulation allows for the site-specific documentation of that variability in order to identify, in a timely fashion, areas where additional reclamation measures may be necessary.

The cover soil-sampling plan was given in Appendix D of the annual report submitted in March 1992. After placement, one cover soil sample will be collected every 5 to 10 acres. Samples will be analyzed for texture, pH, electrical conductivity, sodium adsorption ratio, potential acidity, water holding capacity, and plant nutrients. These data will be used to identify whether highly erodible soils are present. Sample results are summarized in GSM's Annual Reports.

The Draft EIS concluded on page 303 that the proposed sampling and fertilization program would limit soil impacts to the short term. A density of one soil sample per 5 to 10 acres allows for adequate evaluation of the characteristics of replaced soils in terms of both physical and chemical characteristics related to the potential for erosion. Assuming this sampling plan is combined with visual erosion inspection monitoring, the plan is considered to be an effective means of identifying where additional erosion control measures may be needed on contoured waste rock dump slopes.

GSM has, in its Amendment 010 application committed to continued sampling and reporting. However, Stipulation 010-14, based on Mitigation Measure S-1, has been developed to provide for continued monitoring, testing, and restabilization of soils affected by steam venting. Standards and guidelines are provided to identify when stabilization efforts will be required. This measure would be an effective means of assessing and mitigating any soil and vegetation changes occurring as a result of steam venting. In summary, this stipulation has become redundant and is no longer needed.

Stipulation 008-8 *GSM must design erosion control systems including diversions for the waste rock dump, to be submitted in the 1991 Annual Report, which minimize soil loss off steep, long waste rock dump slopes. GSM must monitor erosion rates to validate the effectiveness of proposed benching or other slope breaks in minimizing total effective slope length.*

Rationale: This stipulation was adopted under the original Amendment 008 decision in order to minimize soil loss on slopes. One of the long-term goals of reclamation is to establish plant communities which effectively control soil loss -- restricting losses to rates which are comparable to background levels and do not exceed soil formation rates.

Erosion control system designs, including storm water runoff diversions for the rock dump slopes, were completed in conjunction with designs for storm water runoff diversions around and off the dump tops (see Stipulation 008-4). These designs were described under the response to Stipulation 008-8 in Chapter VII of the annual report submitted in March 1992.

The agencies determined designs were acceptable as described in its review of the 1991 Annual Report. An additional cross section requested by the agencies in the annual report review was included in the Stipulation Review section of Chapter VIII of the annual report submitted in March 1993. This cross section showed the slopes that will be placed on dump tops to allow water to flow into the diversion structures. The section also showed typical distances between diversion structures on the dump slopes and details of the access roads to service the diversions.

Erosion troughs have been in place below the high-grade rock dump reclamation test plots since 1991. Four additional erosion troughs were constructed in the Northwest Rock Dump reclamation test plots in 1994. The erosion troughs currently in place indicate that the majority of erosion occurs as sheet erosion. GSM has also shown that the staggered dozer gouges constructed on the slopes are effective in reducing initial sheet erosion prior to the establishment of vegetation. The calculated erosion rates are significantly less than 2 tons per acre per year, indicating that sheet erosion is not expected to be a long-term concern. Summary reports on erosion rates of test plots were given in Appendices 5.5-1, 5.5-2 and 5.6-2 of GSM's 1995 Operating Permit Amendment Application. The agencies concluded based on the results of the erosion studies at GSM that visual erosion monitoring is adequate to characterize the degree of erosion. The agencies and GSM agree that any visible erosion on reclaimed surfaces would indicate erosion in excess of the 2 tons/acre/year threshold.

GSM committed to implement these plans in Section 4.7.3 of the Operating Permit during final reclamation of each waste rock dump. The Draft EIS analysis concurred with the use of these erosion control systems in Section IV.C.1.a on pages 303-308. However, these designs need to be updated to incorporate additional slope benching requirements in Stipulation 010-18. The original stipulation was completed and therefore is no longer required. Annual erosion monitoring was added to Stipulation 010-17.

Stipulation 008-9 *Based on GSM's current re-evaluation of waste rock dump design and placement, which is being done in order to (1) minimize ultimate slope reduction, (2) increase benching and other slope length breaks, (3) control runoff from major storm events and (4) relocate soils and oxidized waste rock stockpiles, GSM must submit a revised dumping plan for agency approval in the 1991 Annual Report. The plan must include a revised schedule for decommissioning and concurrent reclamation of the waste rock dumps during mine life.*

Rationale: This stipulation was attached to Amendment 008 in order to enhance reclamation by minimizing disturbance and soil erosion. The redesign work has also minimized ultimate slope reduction and increased benching. The revised dumping plan and redesigned dumps were described under the response to Stipulation 008-9 in Chapter VII of the annual report submitted in March 1992 and approved by the agencies.

Proposed rock dump plans can be found in Section 4.3 of the application. The revised waste rock dump plans have accomplished the four goals outlined in the stipulation and are the basis of the EIS evaluations of waste rock dumps. The revised waste rock dump plans are incorporated into the EIS in the detailed analysis of waste rock dump stability, erosion, infiltration, and reclamation.

The EIS evaluated the proposed plan and concluded in the preferred alternative that it was acceptable except that a return diversion for Sheep Rock Creek was needed and that 100-foot benches would provide additional erosion control on future waste rock dumps. These exceptions are required to be implemented under Stipulations 010-5 and 010-18 of Amendment 010, and thus this stipulation is no longer needed.

Impoundment Stipulations

Stipulation 008-10 *GSM must evaluate methods, for the 1991 Annual Report, of minimizing movement of acidic water to the face of the cycloned sands portion of the embankment face of the reclaimed dike. One of the methods evaluated must be application of a wedge of net-neutralizing material composed of either waste rock or calcareous borrow material to the front face of the cycloned sands portion of the embankment face in order to construct an overall slope of 3H:1V on the embankment face. The material must be 24 inches deep at the crest of the embankment and increase in depth down the embankment face.*

Rationale: The agencies required this stipulation as a part of Amendment 008 because of concerns that underdrains in the tailing impoundment would plug over time and cause ARD seepage from the toe of the tailing impoundment. In addition, concerns existed that cycloned sands, because of their textural and chemical characteristics, would provide a minimal barrier to the movement of water through the tailings, thus failing to inhibit the migration of ARD to the tailings face and secondarily impacting the reclaimed surface. By requiring evaluation of placement of a calcareous layer and additional thickness, the agencies and GSM could determine the potential merits and need for such site-specific methods in mitigation of potential ARD impacts.

In the response to Stipulation 008-10 in Chapter VII of the annual report submitted in June 1991, GSM documented that the depositional angle of the cyclone sands is near 3H:1V or flatter. Also, in-place pneumatic piezometer data were presented which indicate that the drains continue to function efficiently and prevent water from seeping out the embankment toe by lowering the phreatic surface in the embankment. Tailing Impoundment No. 1 is decommissioned and the head behind the embankment has decreased which further reduces the potential for seeps at the embankment toe. This documentation indicates that the wedge required by this stipulation is unnecessary.

The sand fraction of the tailing is separated through cyclones and placed over the tailing embankment for construction purposes. Sand from the Tailing Impoundment No. 1 embankment was deposited at 3H:1V or flatter as discussed above, and it is expected that sands on the Tailing Impoundment No. 2 embankment will be deposited at a similar angle. If not, slopes will be reduced to 3H:1V. Reclamation of the cycloned sand embankment is discussed in the Operating and Reclamation Plan given in Appendix D of the annual report submitted in March 1992. The reclamation consists of 2 feet of neutral rock or coarse borrow material for capping, followed by 2 feet of soil, then seeding.

In summary, GSM has evaluated the wedge and found that it will not further minimize movement of water to the embankment face. The embankment is already at 3H:1V, and the drains continue to function efficiently. The agencies concurred with GSM's analysis in its review of the 1991 Annual Report. Reclamation of the cycloned sand face of Tailing Impoundment No. 1 was completed in 1996 and is described in Section 1.0 of the 1997 Annual Report. In addition, reclamation studies stipulated in Stipulation 008-13 would provide the necessary information.

The Draft EIS documented on pages 309 and 310 that the proposed tailing reclamation plan is adequate. Therefore, this stipulation is no longer needed.

Stipulation 008-11 *GSM must initiate the cycloned sand tailing reclamation test plot, discussed in the application [for Amendment 008], no later than when Impoundment No. 1 is filled to capacity, and must monitor and report the effectiveness of the reclamation in controlling the oxidation reaction.*

Rationale: The agencies required this stipulation under Amendment 008 to validate their conclusions that the reclamation plan adopted would be effective. Monitoring is routinely used to ensure that if unanticipated impacts develop the agencies and permittee can take timely steps to design and implement additional mitigations.

Tailing impoundment test plots were designed and monitored by D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department. These plots were heavily monitored to provide data on infiltration and effectiveness of reclamation in limiting seepage, and are fully described in Appendix J of the annual report submitted in March 1992. A final report describing the results of this test plot research is provided in Appendix 5.6-1 of GSM's 1995 Permit Amendment Application. The agencies have concluded that this test plot research has been adequate to evaluate the sand tailings reclamation.

The results of this test plot research concluded that the tailings reclamation cap designs used on the test plots were effective at minimizing infiltration of water into the tailings, and thus, would minimize the amount of seepage from the tailings that would result from direct precipitation. The tailings cap, however, does not exclude oxygen. Therefore, in time, the tailings will acidify, providing a potential for ARD seepage.

On page 3 of the September 10, 1991, DSL letter and comments on GSM's annual report submitted in June 1991, the agencies agreed not to require this additional test plot. It was felt that data from the tailing impoundment flat test plots would be relevant to the sand tailing reclamation on the embankment. This is because these plots will be heavily monitored to provide data on infiltration and effectiveness of reclamation in limiting seepage.

As described in the agencies' review of the 1991 Annual Report, this stipulation is fulfilled. A final report describing the results of this test plot research was given in Appendix 5.6-1 of GSM's 1995 Operating Permit Amendment Application.

The Draft EIS evaluation of the tailing impoundment reclamation plan concluded on pages 308-310 that the tailing impoundment test plot proved the reclamation plan would work and the only additional monitoring needed was to further document the potential for capillary rise. This monitoring need was addressed in mitigation S-6 in the FEIS and in Stipulation 010-17 in this Record of Decision.

Stipulation 008-12 *GSM must place 18-inches of low permeability (10^{-7} cm/sec/yr) soils, in two 9-inch compacted lifts, over the entire final tailing surface, carried to the crest of the embankment face. GSM may apply to the agencies for alternative surface reclamation if GSM can document that an alternative would reduce the seepage of acid water to an equivalent degree as the 18-inch soil layer.*

Rationale: This stipulation to Amendment 008 was required to minimize seepage through the tailings because of concerns over the amount of seepage predicted in various water modeling efforts. A standard of 10^{-7} cm/sec/yr was adopted because it was shown the Bozeman formation could be compacted to that degree in laboratory tests.

In the response to Stipulation 008-12 in the annual report submitted in June 1991, GSM indicated that a permeability of 10^{-7} cm/sec was not achievable with most materials in the field. The agencies agreed that a permeability of 10^{-6} cm/sec for the clay cap would be adequate on page 3 of the September 10, 1991, DSL letter and comments on GSM's June 1991 Annual Report. The rationale included consideration of construction standards used for landfills and other situations where infiltration should be limited, and was consistent with Federal Guidelines for Municipal Solid Waste Landfills (see 40 CFR Part 258). In addition, GSM constructed test plots on the tailing surface in 1992 to evaluate alternative reclamation methods to the clay cap as described in Appendix M of the 1992 Annual Report.

Compaction of the 18-inch clay cap in two separate lifts may not be desirable from an operational standpoint. GSM has demonstrated compaction success in past embankment construction projects by laying material in numerous thin lifts. Compaction equipment was operated continuously during material placement. This method has ensured proper compaction throughout the lift. Similar methodology is envisioned to achieve compaction required under this stipulation. Results will be verified by continuous testing of the material.

The need for clay capping was reassessed by the agencies in the EIS and it was concluded that frost-heaving and other weather-related phenomena would limit the effectiveness of a clay cap in the frost zone. Therefore borrow material should be substituted for the clay material as required in Mitigation Measure W-7. Therefore this stipulation has been replaced by Stipulation 010-10.

Stipulation 008-13 *GSM must develop a final monitoring plan for Impoundment No. 1, in consultation with the agencies, which must be submitted with the 1991 Annual Report. The plan must be designed to quantify the amount and quality of seepage and effectiveness of reclamation in limiting seepage from the impoundment.*

a. *Parameters to be monitored include phreatic water level in the impoundment, seepage, water recharge and quality and other measures for evaluating the effectiveness of reclamation.*

b. *If monitoring reveals that seepage quantity and quality are substantially different from predictions, GSM must revise its treatment plans and areas, in consultation with the agencies.*

Rationale: A monitoring plan was required by the agencies as a part of Amendment 008 in order to validate agency conclusions about the effectiveness of reclamation plans for Tailing Impoundment No 1, and to enable the agencies to identify trends indicating the potential need for

additional mitigation in a timely fashion.

The overall Tailing Impoundment No. 1 monitoring plan is as follows. As agreed upon with the agencies, GSM constructed reclamation plots on a portion of Impoundment No. 1. The reclamation test plan was developed by D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department, and was described in Appendix M of the 1992 Annual Report. The construction included several plots using various capping materials. The monitoring plan measured water levels, seepage, and recharge with pore water samplers, neutron access tubes, and piezometer. The agencies approved the plan and test plot monitoring began in the fall of 1992. A final summary report was given in Appendix 5.6-1 of GSM's 1995 Operating Permit Amendment Application. The summary report concluded that the tailings reclamation cap designs used in the test plots were effective at minimizing infiltration into the tailings, and thus, would minimize the amount of seepage from the tailings that would result from direct precipitation. The tailings cap however, does not exclude oxygen. Therefore, in time, the tailings would acidify, providing a potential for ARD seepage.

Flow rates and water quality are routinely monitored in the pumpback wells to determine the amount and quality of seepage as described in GSM's Water Resources Report submitted annually to the agencies. As described in the reclamation plan in Appendix D of the annual report submitted in March 1992, Tailing Impoundment No. 1 monitoring wells will be monitored until applicable water quality standards are met as required by Stipulation 008-14. Impoundment No. 1 pumpback wells will discharge into Tailing Impoundment No. 2 during mine life, and into the water treatment plant thereafter until applicable water quality standards are met (Stipulation 008-15). All treatment plans will be reviewed at the end of mine life, and a decision will be made whether the closure plans need to be modified and submitted to the agencies (Stipulation 008-24).

The Draft EIS concluded on pages 309-310 that the tailings reclamation plan was adequate. The study plan was designed as required and approved. Study results confirmed the adequacy of the reclamation plan which is now being implemented. Thus, this stipulation is no longer needed.

Stipulation 008-14 *Monitoring of the pumpback wells associated with Impoundment No. 1 and monitoring of reclamation effectiveness in limiting seepage and control of the acidifying reaction must continue until water quality standards can be met in the applicable surface and ground water systems.*

Rationale: The agencies adopted this stipulation under Amendment 008 to ensure no misunderstandings would occur about the required duration of monitoring activities.

GSM routinely monitors water quality from the pumpback systems. These data are in the annual reports. Discharge rates from the south pumpback (SPB) wells and east flank pumpback (EFPB) wells groundwater interception/pumpback systems also are routinely monitored to evaluate

pumpback well operational performance. Discharge rates from the systems are a function of the number and accuracy of flow meters, pump performance, rate of leakage from Tailing Impoundment No. 1, and the flux of groundwater within hydrostratigraphic units beneath the impoundment.

The duration of monitoring is driven by statutory requirements (82-4-351, MCA [i.e. compliance with the Water Quality Act]) because the Draft EIS demonstrated the potential for impacts in Section IV.B.1.c. GSM has subsequently committed to capture and treat until long-term compliance with water quality standards is demonstrated, in Section 7.1 of its Amendment 010 operating plan. Thus, this stipulation is no longer needed.

Stipulation 008-15 *Pumpback wells for Impoundment No. 1 must operate and discharge into Impoundment No. 2 during mine life. After mine life they must be pumped to the treatment plant or other approved facility until water quality standards can be met in the applicable surface and ground water systems.*

Rationale: This stipulation was included as a part of Amendment 008 to minimize the potential for seepage from Tailing Impoundment No. 1 to impact ground water outside the pumpback well perimeter. Pumpback wells are effective because they limit the migration of cyanide and other constituents from Impoundment No. 1. The pumped water is initially directed to Tailing Impoundment No. 2 because it is lined and the water collected in the impoundment is recycled through the mill as process water. At the end of mine life, Tailing Impoundment No. 2 will be reclaimed, necessitating pumpback water, if it still does not meet water quality standards, to be routed to the water treatment plant.

The Draft EIS analysis in Section IV.B.2.a indicated that seepage to groundwater from Tailing Impoundment No. 1 is likely to continue after closure and that collection and treatment is an appropriate method of handling this seepage. GSM has subsequently incorporated this requirement as a commitment in its operating plan for Amendment 010 in Section 7.1. Thus this stipulation is redundant and no longer needed.

Stipulation 008-16 *GSM must submit within 180 days of permit issuance, detailed specifications, for agency review and approval, for the permanent design and construction of the diversion structure around the tailing impoundments. The diversion system must be designed to handle runoff from ½ the probable maximum precipitation event (pmp) and must include*

- *diversion channel specifications,*
- *dam specifications, for the five drainages to be diverted to the east and west of the impoundments, and*
- *specifications for inlet, outlet, and gradient control structures that are required for the drainage dam reservoirs and final discharge to the natural drainages.*

Diversions must be constructed in accordance with the approved design. Annual maintenance of

the diversion structures must be performed. Cost figures must be gathered during the remainder of mine life and must be used to adjust the financing for permanent water treatment to include the long-term maintenance of diversion structures.

Rationale: This stipulation to Amendment 008 was required by the agencies to ensure the final design was conservative in its approach. Factors considered included those which may affect the volume of runoff. Incorporating these factors into the design reduces the potential for runoff to affect development of ARD in the underlying tailings materials.

A final design development report entitled "Supplemental Design Services, East Tailing Disposal Facility" was completed by Sergent Hauskins and Beckwith (SHB) Geotechnical Consulting Engineers of Phoenix, Arizona. Portions of the report discuss the diversion system design around both tailing impoundments. This report was submitted to DSL on June 12, 1991, along with three construction plans showing the layout, survey data, cross sections, and details of the design for diversion structures around both impoundments. The response to comments in the 1992 Annual Report detailed the approval and construction work completed to date on the diversion channels around the impoundments. The diversions are constructed in accordance with approved designs. Annual maintenance, if required, will be completed on the diversion structures and all associated costs will be tracked.

Plans for Tailing Impoundment No. 1 (West Diversion) were submitted in 1988, 1989, and 1990, and approved with the permit for Amendment 008. Some modifications were made to these plans, and after considerable consultation, the agencies approved construction September 1, 1995.

The agencies reviewed the plans for Tailing Impoundment No. 2 (East Diversion) in 1990, and it was constructed in 1991. The main portion of the channel has functioned well; however, portions of the western one-half required repair because of bottom heaving and slope steepening from the 1994 ground movement. Grade reestablishment, channel reconfiguration, and riprapping were completed in 1996. Also, the outfall on the east end has been modified after two intense thunderstorm runoff events repositioned some of the riprap and scoured the channel. A redesign of the outfall was submitted to and approved by the agencies. The outfall was reconstructed with a slightly flatter invert and a bedded riprap, which will prevent washing of fines from beneath and around the larger rock.

The tailing impoundment diversion design was not modified as a result of Draft EIS analysis in Section IV.B.1.c on page 269. Construction started in late 1995 and will be completed during 1998. Therefore the design and construction requirements have been met and this stipulation is no longer needed.

Stipulation 008-17 *GSM must submit a final grading plan, which includes cell-sizing and berm specifications, in the 1991 Annual Report which will distribute runoff from the 100-year,*

24-hour storm event across the reclaimed Impoundment No. 1 and 2 surfaces to minimize both erosion and the concentration of standing water.

Rationale: As noted in the stipulation itself, the agencies required this stipulation to Amendment 008 in order to minimize erosion. In addition, a grading plan which precludes the development of areas where standing water may collect reduces the infiltration of water, decreasing the rate at which acid conditions may develop and decreasing the potential volume of seepage at the base of the impoundment.

GSM submitted this plan in its the response to Stipulation 008-17 in Chapter VII of the annual report submitted in March 1992. The plan was also discussed in Appendix D of this same report. The agencies approved the design on page 14 the 1991 Annual Report review.

The EIS did not identify any necessary design modifications and concluded that water should be drained from surfaces overlying materials with acid generating material as designed. Mitigation G-4 was developed on page 376 of the EIS to ensure the design would remain intact in case of settlement and was adopted as Stipulation 010-2. Therefore the design does not need to be modified; the stipulation has been complied with, and it is no longer needed.

Stipulation 008-18 *GSM must initiate a test plot on the Tailing Impoundment No. 1 to test the effectiveness of the approved reclamation plan and alternative reclamation scenarios that may be more effective in limiting seepage from the impoundments.*

Rationale: The agencies incorporated this stipulation into its decision on Amendment 008 in order to monitor the site-specific effectiveness of the approved plan and to evaluate unproven alternatives. The goal of such an evaluation is to find the combination of reclamation parameters most effective under the site-specific conditions present at the Golden Sunlight mine.

GSM constructed a series of reclamation test plots on Tailing Impoundment No. 1 during 1992. The plot and monitoring plan was developed with D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department. The test plot design and monitoring plan were fully described in Appendix M of the 1992 Annual Report and incorporate a number of features required by the agencies. A final monitoring summary report can be found in Appendix 5.6-1 of GSM's 1995 Operating Permit Amendment Application.

The plots tested three earthen material systems for capping and revegetating impounded tailings. Monitoring occurred through the latter part of 1993 with testing that included a simulated 10-year storm (rainfall) event. Dollhopf et al. determined that all cover systems tested were similar relative to the parameters tested and that any cover system evaluated would be effective in terms of decommissioning the tailing impoundment. It also was noted that a coversoil/borrow material system may exhibit better long-term stability than the other systems tested, which included a clay

cap barrier, and that a cover soil/borrow material system may be more practical and cost effective to construct.

It should be noted that the thicknesses of the capping systems tested by Dollhopf et al. were deeper than that proposed by GSM for use at the project site. Additional onsite analysis conducted by GSM concluded that the proposed 48-inch cover depth would be adequate based on anticipated rainfall events, capillary rise potential, and the potential for revegetation success in terms of plant rooting depth and soil chemistry.

Mitigation Measure S-6 in the EIS proposes to continue a limited monitoring program to assess, through time, any negative changes to the applied plant growth medium. Mitigation Measure G-4 was also added in the EIS to deal with potential settlement of the reclamation covers after reclamation. These mitigations have been incorporated into Stipulations 010-17 and 010-2, respectively, and, therefore, this stipulation is no longer needed.

Pit Reclamation Stipulations

Stipulation 008-19 *Water balance in the pit must be monitored quarterly and data submitted to the agencies, with inflow measurements, in the annual reports.*

Rationale: In the 1990 EA and in the present EIS, the agencies have estimated likely inflows based on a substantial quantity of inflow data. However pit inflow quantities vary with seasonal rainfall and depth and thus will increase as the pit becomes deeper. Monitoring water balances will provide the agencies with additional data to further refine and validate inflow predictions through time, ensuring that final designs for water handling at the end of mine life are adequate.

GSM monitors pit highwall seeps and pit dewatering discharge on a monthly basis to characterize the occurrence of water in the pit. The monitoring results are used to verify earlier water balance modeling estimates for purposes of pit water management.

GSM has monitored and reported water balance in the pit since 1991. Pit seeps are generally difficult to monitor due to poor access and safety concerns. However, GSM attempts to collect data on a monthly basis to help predict the future occurrence and quality of pit water. Pit water monitoring and reporting are ongoing.

The Draft EIS concluded that continued monitoring of pit water balances was needed because flows could vary. GSM incorporated a commitment in Section 6.2 of its Amendment 010 plan of operations to continue monitoring water balance. Stipulation 010-9, based on Mitigation Measure W-6 on Page 379 of the EIS, was developed to address water treatment plant design capacity. Therefore this stipulation has become redundant and is no longer needed.

Stipulation 008-20 *Bond to assure funds for the construction and permanent operation of a permanent water treatment facility must be submitted when the pit intersects the anticipated water table at the 5,350-foot elevation. The amount of bond must be based on actuarial projections of funds required, taking into account:*

(a) anticipated starting date of treatment,

(b) final treatment methods,

(c) projected amount of water to be treated, which will be presumed to be 75 gpm unless data is developed which shows, to the agreement of the agencies, that the amount is different, and

(d) the costs of operation, depreciation and maintenance.

If, in subsequent years, data is developed which shows, to the agreement of the agencies and GSM, that the amount of water to be treated changes from the original determination, the projection and the bond will be adjusted accordingly.

Bond submitted in accordance with this stipulation must be converted to a permanent fund, under the control of the state, at the end of active mine operations.

Rationale: The agencies' analysis in the 1990 EA indicated that mining below the 5,350 level would intersect significant amounts of acidic groundwater. The MMRA allows for the submittal of bonds in increments as long as the bond is submitted before the disturbance occurs. Therefore, a requirement to have the treatment plant bond in place when the water table was encountered is appropriate.

Treatment of initial dewatered tailing effluents from Tailing Impoundment No. 2 was accounted for in GSM's bond submitted in June 1990. A study outlining permanent water treatment plans and expected costs at GSM was included as Appendix O in the annual report submitted in March 1992. This document was modified at the agencies' request to include a 10 percent contractor's profit and is included as an appendix in the Stand Alone Permit document submitted in March 1993. The study covers costs to treat perpetual drainage from both the pit and tailing impoundments should it occur. In addition, treatment for initial dewatered tailings effluents was added to the study because the same treatment plant will be used. GSM re-evaluated water treatment needs as outlined in Appendix A of the EIS and the bond has been revised to reflect this update.

GSM has submitted the bond as required. It has been updated based on annual report reviews. The bond will be further updated based on the selected alternative (see Section V.A. of this Record of Decision). GSM has committed, in Section 7.1 of its operating plan for Amendment 010, to converting the bond to a permanent fund under the control of the state at closure. GSM has not committed in its application to "If in subsequent years, data is developed which shows, to the agreement of the agencies and GSM, that the amount of water to be treated changes from the original determination, the projection and the bond will be adjusted accordingly." This part of the

stipulation needs to be maintained and has been incorporated into Stipulation 010-27.

Stipulation 008-21 *As final pit walls are developed, GSM must use tree plantings on benches and talus slopes where safety, stability, and materials quality allow.*

Rationale: GSM's plans for Amendment 008 did not include adequate plans for pit reclamation. (See also Section V.B, Issue 8, of this Record of Decision). Therefore the agencies placed additional reclamation requirements on Amendment 008 to increase the acreage revegetated and reclaim acreage that is feasible to reclaim. The intent was to increase the available acreage for diverse habitat needs of wildlife, to reduce infiltration of precipitation and to coincidentally reduce visual impacts.

The pit continues to be active and is enlarging, and few walls can be reclaimed. GSM will plant trees on safe portions of the pit walls as areas are abandoned and materials are suitable. GSM has committed to this reclamation plan in its operating plans for Amendment 010.

The EIS concluded GSM's pit reclamation plan in Section 5.3 of the application was adequate except that the ponded water was a potential threat to wildlife using the pit. The EIS also evaluated pit backfill in two alternatives. The No Pit Pond Alternative was selected to eliminate the threat to wildlife. The agencies' conclusions regarding pit backfill are addressed elsewhere in this document. Because this stipulation from Amendment 008 is now a commitment in GSM's operating plans, this stipulation is redundant and is no longer needed.

Stipulation 008-22 *Water, if the volume is significant (based on final pit configuration), must be diverted around the pit perimeter in permanent diversion structures which are designed to handle 100-year, 24-hour precipitation events. The design for this diversion, or documentation of insignificant runon, must be submitted in the 1991 Annual Report.*

Rationale: The agencies required this stipulation as a part of Amendment 008 to reduce the total volume of pit water needing treatment at the end of mine life.

The system for diverting storm runoff around the pit perimeter was designed in conjunction with systems for diverting storm water off and around the dump tops (Stipulation 008-4) and for diverting storm water off the dump slopes (Stipulation 008-8). These were described under the response to Stipulation 008-22 in Chapter VII of the annual report submitted in March 1992. The agencies approved the design in their review of the 1991 Annual Report.

In addition to the previous design information, more supplemental and specific information was provided in Section 4.7 of the operating plan for Amendment 010 submitted and utilized in the EIS analysis. The EIS concluded it is appropriate to divert runoff to minimize the volume of water to be treated. Conceptual designs are shown in Exhibit 4-1 and a commitment to construct

diversions is in the Amendment 010 application. Therefore this stipulation is now redundant and is no longer needed.

Stipulation 008-23 *GSM must develop a plan, in consultation with the agencies, to identify the potential for vertical flows and fracture flows from the pit. This plan must be submitted with the 1991 Annual Report.*

Rationale: The agencies included this stipulation in Amendment 008 because vertical and fracture flows are hard to model accurately. As the pit walls are developed and these features are identified, the agencies and GSM can more accurately predict and mitigate postmining pit inflows. It is also used to adjust the bond (see Stipulation 008-20).

The plan to identify vertical and fracture flows from the pit was included with the annual report submitted in June 1991, in the response to Stipulation 008-9 in Chapter V. The plan was approved in the agencies' review of the 1991 Annual Report. GSM has committed to continue this monitoring in Section 6.2 in its Amendment 010 application. Therefore, this stipulation is no longer needed.

The EIS concluded in the water treatment section that these inflows are hard to predict and Mitigation Measure W-6 was added to account for these uncertainties (see Stipulation 010-9).

Stipulation 008-24 *At the end of mine life, GSM must review the treatment plan and determine whether or not closure plans need to be modified based on data and other information accumulated during mine life. GSM's review and conclusions must be submitted to the agencies and GSM may apply for a revision. The agencies reserve the right to require a modification of the permit under 82-4-337, MCA.*

Rationale: This stipulation was included as a part of Amendment 008 in order to ensure that final plans incorporated the results of long-term monitoring throughout mining into final designs. Although the Amendment 008 environmental assessment and this EIS predict impacts to the extent that science and data allow, monitoring details the actual effects of the mining itself. Monitoring verifies that predictions are or are not accurate, allowing for refinement or modifications of plans to best fit the site-specific conditions encountered.

In its Amendment 010 analysis, the agencies concluded that this review of water treatment plans at closure was needed and Mitigation Measure W-6 was developed (see Stipulation 010-9). Stipulation 008-24 is now redundant with Stipulation 010-9 and is no longer necessary.

Stipulation 008-25 *With each annual report, which must be submitted June 27 of each year, GSM must submit additional bond in the amount of $1,158,000, for the twelve years through and including 2002. In the years 2003 and 2004, $408,000 must be submitted, unless these amounts are revised by future bond evaluations and documented in writing.*

In addition, the current format of the annual report must be expanded to include:

1. *reclamation data with summaries and analysis for all reclamation test plots,*
2. *as-builts required by Stipulation Nos. 3 and 4,*
3. *acid-base potential data from Stipulation Nos. 5 and 6 for those years in which slope reduction and rock capping, respectively, have been implemented,*
4. *soil sampling data (Stipulation No. 7),*
5. *erosion data (Stipulation No. 8),*
6. *data and findings from monitoring of Impoundment No. 1 (Stipulation No. 13),*
7. *pumpback well data (Stipulation No. 14),*
8. *water balance data, inflows, and outflows for the pit (Stipulation Nos. 19 and 23), and*
9. *soil and oxidized cap rock volumes, locations and materials balance, and*
10. *noxious weed control report.*

Data must be continued to be submitted annually for as long as the related activity is underway.

Rationale: This bond was based on the calculated cost to MDSL to implement the plans and stipulations that made up Amendment 008 as required by 82-4-338, MCA, rather than under the authority of MEPA. Bond calculations are on file and available at the agencies' offices. The bonding requirements of this stipulation are superseded by the bonding calculation summary and incremental bonding plan presented elsewhere in this document. Detailed bonding calculations for Amendment 010-- which incorporate all of Operating Permit 00065 plans as amended-- are available from the agencies upon request.

Monitoring requirements 1 through 8 are explained above under the individual stipulations referenced. The soils and cap rock volumes are required under this stipulation to document that GSM has adequately salvaged materials for reclamation in a timely fashion. It is included as a stipulation to ensure that the agencies can monitor GSM's compliance with salvage requirements of the MMRA and its plans.

Noxious weed monitoring is required to ensure GSM can take adequate steps to mitigate invasion

of weeds on its site (weeds may effectively delay the development of the postmining plant community) and to enable the agencies to monitor GSM's compliance with 82-4-336(6), MCA.

The bond and annual reporting requirements outlined in this stipulation have been incorporated into GSM's operating plan for Amendment 010 and are further updated by Stipulations 010-26 and 010-27. This stipulation is no longer needed.

Stipulation 008-26 *At the end of operations, GSM must test areas, which have the potential to acidify and take any additional measures necessary to cover and revegetate these areas, or to channel drainage from these areas to treatment facilities, where necessary. Areas to be considered are portions of haul roads constructed through unoxidized materials, areas around the facilities where spillage of unoxidized rock occurred, and where tailing slurry line spillage have occurred.*

Rationale: The agencies adopted this stipulation as a part of Amendment 008 to minimize the incidence of surficial acidified materials reducing overall reclamation success, thereby maximizing the acreage of the site that achieves its full postmining reclamation potential.

In the existing and proposed reclamation plans, GSM has committed to test areas which have the potential to acidify at the end of mine life and take additional measures necessary to cover and revegetate, or to channel drainage from these areas. GSM has committed to this for all facility areas, including but not limited to the plant site/building area, road and utility corridors. This commitment is in Sections 5.4 and 5.8 of the Amendment Application. The Draft EIS evaluated the total potential acid-producing acres in each alternative in Section IV.C and the acreages are listed in Table IV-8 on page 299. This stipulation is no longer needed.

Stipulation 008-27 *All studies identified in the stipulations above, must clearly define the study objectives, define deliverables, and identify dates by which the deliverables must be submitted.*

GSM must meet annually with the MDSL, the BLM, and the WQB, to discuss monitoring and research findings and to determine the need for additional modifications of reclamation.

Rationale: This stipulation was added to Amendment 008 to clarify the agencies' expectations common to all required plans, thus leaving no room for argument at a later date. All of GSM's plans submitted under Amendment 008 fulfilled these requirements. Plans to be submitted pursuant to the requirements of stipulations attached to Amendment 010 have to meet similar standards. These standards have been identified in the Amendment 010 stipulations that require studies and thus do not need to be retained here.

The annual meeting requirement has been removed. Meetings can be arranged as needed.

Stipulation 008-28 *GSM must submit a final plan which identifies objectives, deliverables and due dates for all reclamation test plots with the 1991 Annual Report. The plan must be developed in consultation with the agencies.*

Rationale: The agencies incorporated this stipulation into its Amendment 008 approval to ensure GSM submitted consolidated plans for the various research activities required under numerous stipulations. This facilitates the agencies' and GSM's tracking of all required activities.

A plan was described in GSM's response to Stipulation 008-28 in Chapter VII of the annual report submitted in March 1992. The agencies approved the plan in the review of the 1991 Annual Report.

Since this an administrative requirement, the EIS did not evaluate its impacts. Rather, the impacts of the individual reclamation plans were evaluated and incorporated into the agencies' selected alternative as described elsewhere in this document. Because the plan has been submitted, approved and implemented, this stipulation is no longer needed.

Stipulation 008-29 *GSM must submit a revised, consolidated operating and reclamation plan which reflects all of the documents identified in the first paragraph of this amendment, discussed in the May 30, 1990, EA, and related information, as well as the designs and plans required in the stipulations above, with the 1991 Annual Report.*

Rationale: This administrative requirement was added to Amendment 008 by the agencies in order to facilitate tracking of all of GSM's evolving commitments throughout the analysis of the original application, as amended in the various documents referenced. Consolidation of materials from various documents enables the agencies to more effectively monitor GSM for compliance with it permit commitments.

This work has been completed. The Interim Dump Operating Plan now serves as an up-to-date summary of GSM's current operating and reclamation plan. The decision for Amendment 010 will require a new stipulation to update the Amendment Application to include the changes required in the EIS and this Record of Decision (see Stipulation 010-28). The impacts of these commitment are the impacts identified for the proposed plan in Chapter IV of the EIS. This stipulation is no longer needed.

Stipulation 008-30 *Wherever in the stipulations GSM is required to develop a study, plan, specification design or other document, that study, plan, design, specification or other document must be submitted to the Department, with copies to the BLM, for approval. Wherever approval is required, this approval requirement means that*

(1) if approval is not granted, the study, plan, design, specification or other

document or documentation may not be implemented and no action may be undertaken pursuant to the study, plan, design, specification or other document or documentation, and

(2) if approval is granted, GSM must conduct its operations in accordance with the study, plan, design, specification, or other document or documentation.

Rationale: The agencies incorporated this requirement as a stipulation to Amendment 008 based on their experiences with complex plans. This stipulation was intended to clarify which limits will be used by the agencies in determining compliance.

Since this an administrative requirement, the EIS did not evaluate its impacts. Rather, the impacts of the individual reclamation plans were evaluated and incorporated into the agencies' selected alternative as described elsewhere in this document.

These limits are superseded by the limits established under Amendment 010. Therefore this stipulation carries forward into Amendment 010, as Stipulation 010-29.

Stipulation 008-31 *Prior to further disturbance, GSM must complete a level III cultural resource survey on the north half of section 29, T2N, R3W. The survey report must be filed with the agencies no later than the 1991 Annual Report and GSM must implement the mitigation measures necessary to ensure compliance with the National Historic Preservation Act, as amended.*

Rationale: Because GSM had not yet fulfilled its requirements under the National Historic Preservation Act, as amended, the agencies added this stipulation to Amendment 008 to ensure timely compliance and appropriate protection of cultural resources within the permitted disturbance area.

A level III cultural resource survey was completed for T2N, R3W, section 29, N½ by Western Cultural Resource Management, Inc. The report entitled "A Cultural Resource Inventory for a Proposed Exploratory Drill Hole Program for the Golden Sunlight Mine in Jefferson County, Montana" was submitted to MDSL in November 1990. The agencies concluded in their review of the 1991 Annual Report that GSM had fulfilled this stipulation.

IV. AMENDMENT 010 STIPULATIONS

The following stipulations will be attached to the operating permit as a part of Amendment 010. All other stipulations previously attached to Operating Permit 00065 remain in full force and effect unless specifically modified in this and the preceding section of this ROD. GSM must

comply with the stipulations, and the stipulations are enforceable elements of the operating permit. Stipulation 008-3 remains in full force and effect.

These stipulations are based on modifications to the proposed plan in the Return Diversion and No Pit Pond alternatives. As explained in the EIS, these stipulations mitigate specific impacts of the proposed plan identified in Chapter IV of the EIS. Following each stipulation is a brief rationale for its adoption.

Geology, Minerals, and Paleontology

Stipulation 010-1 (EIS Mitigation Measure G-2)

Geodetic monitoring programs to detect ground movements associated with the landslide blocks during operations must be expanded to include the East Waste Rock Dump and continue as described in the existing operating permit and incorporated into the August 1995 Operating Permit Amendment Application. Geodetic monitoring may cease after reclamation has progressed to finished slopes with capping and soil in place and vegetation established. This stipulation will address concerns related to future slide block movement, potential movement in the East Waste Rock Dump area and movement of structural foundations.

Rationale: This stipulation will provide for detection of any further ground movements in the identified slide block areas during operations. Geodetic monitoring will no longer be necessary after completion of operations because in the absence of mining activity, the likelihood of any additional slide block movement is low. GSM did not commit to monitoring the East Waste Rock Dump in its application.

Stipulation 010-2 (EIS Mitigation Measure G-4)

Postreclamation monitoring of stability of reclaimed areas to detect disrupted reclamation must continue annually and be reported in the annual report. Monitoring may be discontinued when GSM successfully demonstrates the area is eligible for bond release. Settling, erosion and other surface failures to any reclaimed area must be mitigated by regrading the surface where necessary and repairing the cover as needed to restore its function and maintain the desired slopes except for inaccessible pit benches.

Rationale: This stipulation will provide for detection of any disrupted reclamation on all reclaimed surfaces, such as movement of waste rock dumps from creep, tailing impoundments from settlement, periodic washouts of ditches from storms, etc. This disruption of reclaimed areas is just as important, but geodetic monitoring is not necessary to identify these types of movement.

Settling of the tailing impoundments is expected as consolidation occurs. Differential settlement in tailing material could result in ponding of water on the surface or damage to the reclamation

cover, reducing the cover's effectiveness at preventing infiltration. Maintenance performed as needed on the impoundment surface and the tailing caps will be effective in maintaining cover integrity and function. Waste rock dumps can be affected by either minor differential settling or renewed slide block movement. Any reclaimed area may experience disruption (movement, erosion, etc.) and must be maintained and repaired.

Stipulation 010-3 (EIS Mitigation Measure P-1)

If previously undocumented paleontological deposits are located during project operations, GSM must contact the agencies for evaluation of the resource by agency-approved professional paleontologists. If significant resources are identified, impacts must be mitigated through an appropriate treatment plan, approved by the agencies, or through site avoidance.

Rationale: This stipulation will allow evaluation of previously unknown and potentially significant paleontological deposits that might be discovered during mining. It also will provide adequate time for presentation and recovery of the resources, if this is deemed necessary by the agencies.

Water Resources

Stipulation 010-4 (EIS Mitigation Measure W-1, W-2)

The existing water resources monitoring program (Appendix A of the Draft EIS) must be updated and submitted for agency review and approval in the next annual report after issuance of permit Amendment 010 to monitor flows and water quality at springs in the project area and to identify any changes in flow or water quality. Data must be collected frequently enough to detect spring response to seasonal variations and pit dewatering.

If spring discharge declines, the affected spring must be developed further by improving collection and storage of spring discharge or by expanding the interception area at the water table. Alternatively, water must be diverted from the water treatment plant for use by wildlife and livestock. Reduced water quality must be mitigated by establishing additional water sources for wildlife and livestock supplied with treated water discharged from the water treatment plant.

Rationale: This stipulation will provide monitoring data to the agencies that will identify any variations in spring discharge and water quality and provide data to determine if changes in spring flows or water quality are caused by mining. If mining-caused changes occur, GSM must, as required by 82-4-355, MCA, provide replacement water. Water sources will continue to be available for wildlife and livestock.

Stipulation 010-5 (Return Diversion Alternative and EIS Mitigation Measures W-3 and W11)

GSM must design and construct a permanent channel to divert the Sheep Rock Creek Drainage around the East Waste Rock Dump, reconnecting on the south side of the dump to a tributary of

Sheep Rock Creek, approximately 3,100 feet upstream of the main channel. The channel design must transport one-half probable maximum flood flows and must incorporate armoring and energy dissipation structures to protect the integrity of the diversion. A two-track maintenance road must be established adjacent to the diversion, adequate to transport a pick up and to support any necessary future maintenance following construction. Plans to comply with these requirements must be submitted for agency review and approval with the next annual report.

Diversion channels could cause increased erosion in the receiving tributaries. GSM must inspect and maintain the diversion channels and the receiving tributaries annually and document results in the annual reports. Maintenance will include adding erosion protection in affected channel reaches or installing check dams or other grade control or channel stabilization structures. GSM must also inspect the receiving tributaries after major storm events and repair any resulting channel damage in consultation with the agencies.

Rationale: This stipulation will monitor and, if necessary, eliminate erosion problems or sedimentation in the receiving tributary channels caused by the diversions after mining ceases.

Stipulation 010-6 (EIS Appendix 1)

MDEQ has designated a groundwater mixing zone for discharges from GSM facilities that provides a limited area where initial dilution of the discharges will take place, where water quality changes may occur, and where standards may be exceeded. The Statement of Basis (Final EIS Appendix 1) describes the mixing zone and explains MDEQ's rationale for designating the mixing zone. GSM must implement all compliance monitoring, contingency plans, and mitigation plans required by, and described in, the groundwater mixing zone Statement of Basis, in Appendices A and B in the EIS, and in the application for a source-specific groundwater mixing zone.

Rationale: Analysis in the EIS of potential impacts to groundwater indicate that groundwater contamination will occur within the immediate vicinity of the mine facilities whether the mine expansion is permitted or not. The mixing zone with the required monitoring program and contingency and mitigation plans will define acceptable limits for the spread of groundwater contamination, thus confining impacts to as small an area as possible, and protecting beneficial uses.

Stipulation 010-7 (EIS Mitigation Measure W-4)

If the data collected from existing monitoring wells or spring flows under the existing monitoring plan (as updated under Stipulation 010-5) indicate that changes in water quality are occurring that are likely to exceed applicable regulatory requirements, one or more of the mitigation measures noted below must be implemented as follows:

a) If water quality changes are detected in monitoring wells at the mixing zone

boundary downgradient from the East Waste Rock Dump, localized capture of groundwater might be needed to contain acid rock drainage (ARD) transport along preferential, discrete flow paths that were not anticipated by the ARD fate and transport model (EIS Appendix J). If so, a capture system similar to the system described in Appendix A of the EIS for the West Waste Rock Dump must be installed. Captured water must be treated before discharge. Capture of discrete plumes from the East Waste Rock Dump may not require a well system as extensive as assumed for the West Waste Rock Dump.

b) *ARD-impacted seeps might emerge at the toes of the dumps where preferential drainage paths occur within the dumps that lead to discrete "perched" saturated zones at their base. Shallow groundwater capture systems, such as toe drains, around the peripheries of the waste rock dumps must be installed to supplement the primary, deep capture well system. Any captured seepage must be treated before discharge.*

c) In situ *treatment systems, if demonstrated to work, may be installed to treat ARD-impacted water that might collect in the shallow (perched) aquifer zones, including the alluvial materials over bedrock on the west side, and/or the colluvial/alluvial materials in Rattlesnake Gulch or at other locations down gradient of the East Waste Rock Dump.*

Rationale: ARD-impacted groundwater could bypass the primary capture wells along shallow perched flow paths around the peripheries of all the dumps, or move through high-conductivity preferential flow paths down gradient from the East Waste Rock Dump. The required supplemental systems will provide for capture of these potential ARD sources before the contaminated water migrates down gradient to beneficial uses, or to sensitive receptors, such as the Jefferson River. The contingency design in Appendix A of the EIS that provides for treatment of approximately 20 percent of the predicted flux on the east side is considered adequate for this mitigation measure.

Stipulation 010-8 (No Pit Pond Alternative and EIS Mitigation Measure W-5)

GSM must submit, for agency review and approval, a detailed plan for ensuring no water collects in the bottom of the pit at the end of mine life. The plan must include a working area, at the 4,800 foot level, protected by berms from rock fall and an underground pump and transportation system which directs water to the water treatment plant and ensures the pit remains dry. The plan must be submitted with the next annual report.

Following treatment, water must be discharged from the water treatment plant back to the aquifer as recharge, or discharged as surface water if impacts to downgradient beneficial uses are anticipated from capture-well drawdown of the aquifer.

Rationale: If impacts to beneficial uses are anticipated, this measure will minimize impacts to beneficial uses of water downgradient of the groundwater capture system by maintaining the quantity of water available in the aquifer.

Stipulation 010-9 (EIS Mitigation Measure W-6)

Because the rate of inflow from future sources is uncertain, the design capacity of the water treatment plant must allow for additional flow of up to 25 percent above the estimated rate at the time the final design is prepared. The capacity of the water treatment plant must be reevaluated for the final design 2 years prior to mine closure. Storage for up to 6 months of anticipated water inflow must be available for use during construction of plant modifications or a new plant. Alternatively, a new, additional water treatment plant may be constructed to handle the treatment of a specific source or sources. This supplemental water treatment plant will be built at the time such sources are identified.

Rationale: Two years prior to mine closure, the actual rate and quality of pit inflow during peak-flow and low-flow periods, and the total rate and quality of groundwater captured in the tailings area, will be better known. Early design re-evaluation will provide time to increase the plant's capacity, or build an additional plant, if future inflows are higher than expected.

Stipulation 010-10

Eighteen inches of agency-approved borrow material must be substituted for the presently permitted 18-inch clay layer in the Tailing Impoundment No. 1 cap.

Rationale: The impact analysis concludes that the presently permitted clay layer could be damaged by desiccation or freezing and thawing. The cover system will be more effective because the borrow material will be more conducive to plant growth than the clay. Improved plant growth will reduce seepage by using more of the precipitation that falls on the unlined impoundment. The additional 18 inches increases the reclamation cover to a total of 5.5 feet. There are data in Appendix 5.6.2 of the application to suggest 4 feet is an adequate thickness for reclamation of ARD materials. However, since the impoundment is not lined, the increased depth will allow greater root development, enhancing evapotranspiration of infiltrated water. The agencies believe this more conservative approach will increase the potential to reduce seepage from Tailing Impoundment No. 1 to a level that will allow the eventual removal of the extensive pumpback well system at Impoundment No. 1.

Stipulation 010-11 (EIS Mitigation Measure W-8)

If data from monitoring wells indicate that Tailing Impoundment No. 2 and/or the reclaim pond liners are leaking, pumpback wells must be installed as needed to effectively contain any impoundment fluid plumes. The pumpback flows will be treated in an enlarged or supplemental water treatment plant, as described in Stipulation 010-9.

Rationale: Groundwater interception and pumpback have been shown to be effective for controlling seepage from Tailing Impoundment No. 1, and would likely also be effective for containing leaks from Tailing Impoundment No. 2 and/or the reclaim ponds. It is anticipated that pumpback wells installed to contain Tailing Impoundment No. 2 leaks would be pumped at rates similar to the pumpback wells at Tailing Impoundment No. 1. It is likely that fewer wells would be needed for several reasons. Leakage from Tailing Impoundment No. 2 is likely to come from localized damage to the synthetic liner. The underlying compacted clay liner will slow leakage because of its very low permeability. Shallow alluvial channels that act as drainage conduits under Tailing Impoundment No. 1 were removed before Tailing Impoundment No. 2 was built. The remaining underlying material has low permeability so that leakage will move slowly and can be collected more easily.

Stipulation 010-12 (EIS Mitigation Measure W-9)

Prior to mine closure, a trench drain or dewatering wells must be constructed within the Rattlesnake hydrostratigraphic unit upgradient of Tailing Impoundment No. 1, the known source of water to the historic spring at the north end of the impoundment. GSM must submit a plan, design, and supporting rationale and data for agency approval within 1 year of issuance of permit Amendment 010. The trench drain or wells must be designed to intercept between 20 and 30 percent (40 to 60 gpm) of the estimated Rattlesnake Unit groundwater flow (200 gpm) and route this water by gravity drainage to a discharge area away from the impoundment area. This system must be monitored for at least 9 months, including the period of February to June, prior to mine closure so that the results can be incorporated into the final design of the water treatment plant.

Rationale: This measure will lower the groundwater table within the Rattlesnake Unit to eliminate the hydraulic contact between the groundwater and the tailings. Reducing groundwater flow under Tailing Impoundment No. 1 will reduce the amount of cyanide, TDS, and ARD constituents that could be mobilized in groundwater beneath the impoundment.

Stipulation 010-13 (EIS Mitigation Measure W-10)

By the date of the next annual report, GSM must design for agency approval a hydrologic investigation of the bedrock hydrostratigraphic unit on the west side of the project area that it will conduct to identify major water-bearing fractures for monitoring and future groundwater capture of dump seepage. The study must include geologic mapping, test well drilling, and aquifer testing. In consultation with the agencies, GSM must use the results of the study to determine optimum groundwater monitoring locations and to design, for agency approval, a groundwater capture system to prevent impacts to beneficial water uses.

Rationale: A hydrogeological investigation to identify major water-bearing fractures on the west side of the project area will increase the efficiency of the groundwater capture system and prevent

impacts to beneficial water uses.

Soils and Reclamation

Stipulation 010-14 (EIS Mitigation Measure S-1)

A program for the continued monitoring of existing waste rock test plots to further assess the impacts, if any, that steam venting might have on reapplied soil or establishing vegetation must be implemented. GSM must annually monitor and report the number, location, and size of steam vents and extent of modified plant communities surrounding vent locations.

If detrimental effects to establishing vegetation communities are observed on more than 0.1 percent of the total reclaimed area covering acid-producing materials, GSM must: 1) rock armor vent locations, 2) sample and test soils and vent gases at vent locations, and 3) prepare a detailed plan to further reduce the expansion of steam vents and minimize potential impacts to reclamation success. Soil parameters to be tested will correspond to those which appear to have given rise to the change in vegetation communities. At a minimum, soils pH and ABA must be evaluated for each sample collected. GSM will consult with the agencies on the gases to be monitored.

Rationale: Vents have developed within the existing reclaimed areas. As described in the Draft EIS, observations to date suggest that plant community changes are occurring in localized areas. This program will be an effective means of assessing and, if necessary, mitigating the localized changes occurring to reapplied soil materials (if any occur) and to vegetation communities as a result of steam venting. The results of testing will be directly applicable to assessing whether steam venting has a negative effect on reclamation success and/or whether it is a necessary stage of reclamation which enhances the driving off of moisture from the underlying materials.

Stipulation 010-15 (EIS Mitigation Measure S-4)

Based on the results of onsite studies, GSM must use soils containing high rock fragment contents (up to 50 percent coarse rock fragments, at least 20 percent rocks greater than ¾ inch in diameter) as part of the reclamation cap proposed for waste rock dumps. A combination of alternate erosion control techniques may be used in lieu of the proven high rock fragment content soils, if it can be shown that the substituted technique(s) will be at least as effective at reducing erosion potentials on reclaimed slopes and particularly after a fire or major precipitation event.

Rationale: This mitigation measure will reduce erosion potential on reclaimed areas, particularly long, steep slopes. Use of coarse soils at GSM and on other mines has demonstrated the effectiveness of this requirement.

Stipulation 010-16 (EIS Mitigation Measure S-5)

Based on the results of onsite test plot studies, GSM must include mulching as part of the revegetation technique sequence proposed for disturbed areas. A combination of alternate mulching, cover crop, or seedbed manipulation techniques may be used in lieu of the proven mulching technique, if it can be shown that the substituted technique(s) will be at least as effective at reducing erosion potentials and increasing revegetation success.

Rationale: This mitigation measure will improve revegetation on disturbed areas, particularly long, steep slopes, by enhancing germination success of species used for reclamation, by retaining soil moisture, and by minimizing suitable sites for the establishment of weed seed. Each of these techniques has been shown to be effective based on numerous scientific studies over the past 20 years.

Stipulation 010-17 (EIS Mitigation Measure S-6)

GSM must monitor waste rock dumps to assess amounts of lime needed for future reclamation, to evaluate plant establishment and to evaluate erosion.

- *Monitoring of waste rock dumps will consist of annually assessing pH, NAG pH, and ABA of the soil, soil/oxide cap transition zone, oxide cap, oxide cap/unoxidized waste rock transition zone, and unoxidized waste rock "horizons" to a sufficient depth (40 to 48 inches) in a series of soil test plots to determine whether detrimental changes in these parameters are occurring within the root zone through time. The results will be submitted to the agencies in annual reports.*
- *Plant cover and species composition assessments must continue, as per the existing reclamation plan in the current operating plans, Section F (Reference Areas and Vegetation Comparisons).*
- *Erosion also must be visually monitored based on soil surface features such as rilling, pedestaling, etc.*

A similar but abbreviated monitoring effort must be conducted at the tailings facility and selected waste rock dump sites to assess the potential for capillary rise from tailings into the reapplied soil materials and acidification of reapplied soil over waste rock, respectively. GSM must submit a monitoring plan for agency approval by the first annual report following the effective date of the permit amendment.

Rationale: Monitoring will enable the agencies to verify reclamation success prior to bond release and to identify ways to improve reclamation techniques should any changes occur in seedbed materials and the associated erosion rates and plant cover through time. The agencies will then use this information to determine if additional reclamation work is necessary for the particular chemical characteristics of the material over which the soils were applied.

Stipulation 010-18 (EIS Mitigation Measure S-7)

The vertical distance between benches on reclaimed slopes must be reduced from 200 to 100

feet. This will reduce slope length to 225 feet on 2:1 slopes and 320 feet on 3:1 slopes. Currently resloped or reclaimed areas will not be changed unless erosion becomes a problem for reclamation success. Other measures can be added, with agency approval, such as additional surface rock mulches, rock breaks applied on slopes, etc., to produce the same effect as additional benches.

GSM must update designs for engineered diversions and erosion control systems for the waste rock dumps based on the selected alternative. The new designs must be submitted for agency review and approval with the next annual report.

Rationale: Test plot results in the EIS show a 200-foot slope break minimizes erosion to acceptable levels. However, reducing slope length further will reduce the erosion potential on reclaimed slopes, especially after a fire or major precipitation event, and will also provide additional access for slope maintenance, when needed. The shorter slopes will, therefore, provide an additional measure that ensures reclamation success.

Stipulation 010-19

Final reclamation of the tailing impoundments must be completed within 2 years after the tailings have completely consolidated.

Rationale: Under MMRA, reclamation activities must, to the extent feasible, be completed not more than 2 years after completion or abandonment of the operation on that portion of the complex. Tailing consolidation will take 8 to 10 years to be complete and reclamation of the tailing impoundment is not possible before consolidation is complete. Therefore the agencies are providing GSM a longer period for reclamation.

Wildlife Resources

Stipulation 010-20 (EIS Mitigation Measure WF-2)

GSM must notify the agencies of the presence or absence of any of the seven sensitive bat species listed in the EIS prior to closing any shafts, adits, or man-made structures during mine operation, so that the agencies can determine what mitigation will be needed if bats inhabit these areas. GSM must develop necessary plans in consultation with the agencies and submit the plans for review and approval.

Rationale: These measures would prevent direct impacts to bat species that might occupy abandoned underground openings. Long-term, indirect impacts, such as reduced reproduction or foraging habitat modification, may still occur. However, such impacts are unlikely because GSM does not anticipate encountering any shafts, adits or man-made structures as it implements Amendment 010.

Stipulation 010-21 (EIS Mitigation Measure WF-3)

Raptor surveys must be conducted during the breeding season prior to the initiation of mining activities on previously undisturbed lands between March 1 and August 15. If an active nest site is located, restrictions may be applied to adjacent disturbance activities during the breeding season depending upon species. Measures will be identified by the agencies to protect breeding raptors. Depending upon the species and the nest's location in relation to the planned mining activities, protection measures may include construction constraints near the nest during sensitive early periods of the breeding season (e.g., courtship and incubation). The historic raptor nest located north of the tailing impoundment must be avoided, or, if it cannot be avoided, this nest must be removed before or after the active breeding season (March 1 to August 15).

Rationale: Surveys will determine the potential for directly impacting breeding raptors during nesting, and the appropriate protection measures will prevent disturbance of breeding birds. Nest removal outside the breeding season will minimize the loss of annual productivity for breeding raptors.

Stipulation 010-22 (EIS Mitigation Measure WF-4)

To avoid any violation of the Migratory Bird Treaty Act, GSM will conduct nesting bird surveys prior to disturbing undeveloped ground or removing vegetation. If active nests are found, GSM will not disturb the area between May 1 and July 31 or will consult with the U.S. Fish and Wildlife Service to apply appropriate protection measures.

Rationale: This stipulation will reduce the possibility of GSM inadvertently disturbing nesting migratory birds or State Species of Special Concern or destroying their eggs or nests. Purposeful killing of these species or destruction of eggs or nests is a violation of the federal Migratory Bird Treaty Act.

Hazardous Materials and Wastes

Stipulation 010-23 (EIS Mitigation Measure HM-1)

Hazardous material, as defined by the Resource Conservation and Recovery Act (RCRA), must be stored in a berm lined with an impermeable layer, rather than a soil or gravel berm. Spills within the containment berm must then be recovered with a vacuum truck, or similar device, and either recycled or disposed of as necessary.

Rationale: This measure will reduce the quantity of soils potentially impacted by spills around tanks and storage vessels.

Stipulation 010-24 (EIS Mitigation Measure HM -3)
GSM must provide to all personnel awareness training in the proper reporting and response requirements for spills of hazardous material, as defined by RCRA. GSM must provide key response personnel with OSHA hazardous material training.

Rationale: This measure would increase worker awareness of hazardous material dangers and reduce the impacts due to spills. Rapid and appropriate response to minor releases of hazardous material will reduce the amount of soil and/or water that would be impacted. Requiring appropriate personnel to have OSHA hazardous material training will reduce the chance of accidents in storage and transport of hazardous materials and increase overall safety.

Cultural Resources

Stipulation 010-25 (National Historic Preservation Act and EIS Mitigation Measures C1 and C2) *GSM must comply with the standards outlined in the February 5, 1998, document, The "Green Sheet" Cultural Resource Compliance Documentation, attached to this decision.*

Rationale: Analysis of the expansion plans concluded that cultural resource mitigations C-1 and C-2 are needed under Amendment 010. The Butte District's standards incorporate the requirements set out in Mitigations Measures C-1 and C-2. These standards would reduce, but not eliminate, indirect impacts, such as souvenir hunting, to cultural resources on both public and private lands.

Administrative Stipulations

Stipulation 010-26 *The annual report will cover the preceding calendar year and will be submitted by March 31 of each year. The agencies will review the annual report by May 31 which will allow GSM time to acquire additional bond increments, if needed because of increased disturbance, before the report due date of June 27th.*

In addition, the current format of the annual report must be expanded to include requirements in the stipulations attached to the operating permit in this record of decision:

1. *Geodetic monitoring of the East Waste Rock Dump complex during operations (Stipulation 010-1).*
2. *Postreclamation monitoring of reclamation areas to ensure integrity of cover systems (Stipulation 010-2).*
3. *Diversion inspection and maintenance programs (Stipulation 010-5).*
4. *Steam vent number, size and gas monitoring (Stipulation 010-14).*
5. *Waste rock dump root zone chemistry/lime evaluations, reclaimed plant community*

and visual erosion monitoring, and capillary rise monitoring (Stipulation 010-17).

Rationale: This administrative requirement is incorporated into the Amendment 010 conditions in order to ensure there is no doubt about what the agencies expect to be included in the annual reports. The needed for the specific monitoring requirements is addressed under each of the cross-referenced stipulations.

Stipulation 010-27 *GSM must submit a surety bond, in the amount of $29,700,000, at the time of issuance of Amendment 010. The surety bond will provide for reclamation and for the construction and permanent operation and maintenance of the water treatment plant. The surety bond for water treatment must be written to ensure that the total bond amount is available to MDEQ immediately in case the bond is forfeited.*

GSM must submit additional bond as outlined in the incremental bond schedule attached to this ROD.

Rationale: This bond was based on the calculated cost to MDEQ to implement the plans and stipulations that make up Amendment 010 as required by 82-4-338, MCA, rather than under the authority of MEPA. Bond calculations are on file and available at the agencies' offices. Detailed bonding calculations for Amendment 010, incorporating all of Operating Permit 00065 plans as amended by this decision, are available from the agencies upon request. Bond has been divided into increments correlated with disturbance areas, such that the amount of bond held by the agencies is adequate to cover the maximum disturbance occurring in each phase of mining.

Stipulation 010-28 *By the date of the next annual report, GSM must submit a revised operating and reclamation plan which reflects all of the changes required in the EIS and this decision. The revised document must include appropriate sections in the current operating plan that are currently cross referenced in the Amendment Application.*

Rationale: Submittal of an updated consolidation will ensure that the permitted plan is clearly spelled out in one document rather than in a number of separate reports and plans which may not be consistent with each other.

Stipulation 010-29 *Wherever in the stipulations GSM is required to develop a study, plan, design, specification or other document or documentation, that study, plan, design, specification or other document or documentation must be submitted to MDEQ, with copies to the BLM, for approval. Wherever approval is required, this approval requirement means that*

(1) if approval is not granted, the study, plan, design, specification or other document or documentation may not be implemented and no action may be undertaken pursuant to the study, plan, design, specification or other document or documentation, and

(2) if approval is granted, GSM must conduct its operations in accordance

with the study, plan, design, specification, or other document or documentation.

Rationale: The agencies incorporated this requirement as a stipulation to Amendment 010 based on their experiences with complex plans. This stipulation was intended to clarify which limits will be used by the agencies in determining compliance.

Mitigation Measures Considered but not Stipulated

Mitigation Measure HM-2: Mitigation of the amount of soil impacted and removed due to the drainage of areas such as equipment/truck wash stations and equipment maintenance facilities would be accomplished by means of collecting and draining all washout/runoff from the area into an oil/water separator before discharge to surface waters. Paving these areas such that washout/runoff collected in a central drain also would eliminate the impact to soil. Used oil sludge would then be recovered with a vacuum truck and either recycled or disposed of consistent with HWMA requirements.

Rationale: GSM's storm water pollution prevention plan monitoring reports for 1995 through 1997 indicate no visual observations of oil or grease in the runoff diversions around the facilities area. The chemical oxygen demand is low and consistent with the results of the visual observations. GSM's best management practices are adequately controlling oil and grease at the mine site. Therefore, a stipulation for this suggested mitigation measure is not needed.

Mitigation Measures G1 and G3 deal with geodetic monitoring of the slide blocks (G1) and structural foundations (G3) have not been adopted as stipulations to Amendment 010.

Rationale: GSM has committed to slide block movement monitoring in Section 6.6.1 of the amendment application. Similarly, GSM has committed to structural foundation monitoring in Section 6.6.2. Therefore G1 and G3 are not needed. G2 is needed to expand geodetic monitoring to the east waste rock dump complex.

Mitigation Measures S-2, S-3, G5, and WF1 all are specific to alternatives not adopted under this decision.

V. IMPLEMENTATION

These decisions are effective upon the signing of this record of decision and the approval of the Plans of Operations by BLM. Surface disturbing activities may be implemented by GSM following submittal of the reclamation performance bond to MDEQ for the amount established by MDEQ and BLM *and* following issuance of the MMRA operating permit amendment.

A. Other Rights and Permits

Approval of the modified Plan of Operations for GSM by BLM does not constitute a determination regarding the validity or ownership of any unpatented mining claim involved in the mining operations. Approval of the permit amendments by MDEQ and BLM does not convey or create any real property rights or use rights.

GSM's Stormwater Pollution Prevention Plan was approved under general discharge permits issued August 25, 1993, and December 7, 1994. No changes in these permits result from this decision. The statement of basis for a groundwater mixing zone has been prepared and will be incorporated into the operating permit amendment through Stipulation 010-6.

GSM holds air quality permit #1689-04 and must continue to comply with its requirements. No modifications to this permit have resulted from the decision.

GSM is responsible for obtaining any property rights, easements, mineral rights, or water rights necessary to implement the selected alternative. GSM is responsible for obtaining any other local, state, or federal permits, licenses, or reviews that might be necessary to implement the selected alternative.

During implementation of this decision, GSM may propose waivers, exceptions, or modifications to the mining and reclamation plans, and associated stipulations or conditions. Such changes could be appropriate to allow the use of alternate mitigation methods that might be developed in the future, or to respond to an improved understanding of site conditions gained through operational experience.

Any proposed change to the operating procedures, schedule, reclamation design, or mitigation measures will be reviewed by the agencies and accepted if the change would provide resource protection equal to or greater than the original requirement, and would not result in significant impacts not identified in the EIS. Proposed changes that would not achieve the same level of resource protection, or would result in previously undisclosed significant impacts, would require supplemental analysis under NEPA and MEPA prior to determining their acceptability.

B. Reclamation Bond

A reclamation bond is to be posted and maintained in an amount that would enable the agencies to implement the reclamation and other plans as stipulated above and in prior amendments should GSM be unable or unwilling to do so. The bond will cover costs associated with the operation, maintenance, monitoring, and periodic replacement of the permanent water treatment plant. The reclamation bond may be posted incrementally or released to reflect stages of mine development and performance of concurrent reclamation, but will always remain at an amount adequate to pay

for the reclamation of any disturbances that might exist. The public will be notified of the results of the 5-year bond review and any proposed bond releases and provided the opportunity to comment. The entire reclamation cost estimate will be reviewed and adjusted by the agencies at least every 5 years to account for changes in reclamation costs and inflation. The reclamation bond does not represent the limits of GSM's liability should actual reclamation performance not meet the requirements in the reclamation plan or comply with environmental laws.

In complying with the full extent of MMRA, Section 82-4-338, a reclamation bond has been estimated for the Golden Sunlight Mine reclamation. Based upon the information submitted, the bond has been estimated at $64,087,000. Interest or indices used to calculate the bond amounts necessarily change with time. Therefore, any bond amounts used in this ROD are subject to change over time.

This bond estimate is based on the reclamation plan contained in the Amendment 008 and 010 operating plans submitted by GSM in the *Hard Rock Mining Permit Application and Plan of Operations for an Amendment to Operating Permit #00065* dated August 25, 1995, and subsequently modified by this decision.

The reclamation plan submitted in 1995 is a part of GSM's Proposed Action evaluated in the EIS. The Proposed Action modified by the Return Diversion and No Pit Pond alternatives has been selected for implementation. Additionally, numerous stipulations will be attached to the operating permit, as documented above. This bond estimate has been prepared for the selected alternative. Provisions in the stipulations are included as line items and contingencies within the bond. Supporting details of the bonding summary are available from the agencies upon request (approximately 50 pages).

This bond estimate has been divided into specific items that include: (1) reclaim the West and East Waste Rock Dumps, (2) reclaim the support facilities, (3) reclaim the miscellaneous disturbances, (4) reclaim Tailing Impoundments No. 1 and No. 2, (5) construct and maintain surface water diversion and drainage system, (6) reclaim accessible areas in the open pit, (7) monitoring, (8) interim maintenance costs, and (9) water treatment. Each task and its calculated cost for agency implementation is briefly summarized below.

(1) **Reclaim Waste Rock Dumps** includes regrading the West and East Waste Rock Dumps and Buttress Dumps from angle-of-repose to site-specific 2H:1V or 3H:1V slopes (see Amendment Application Exhibit 1-2) and capping the dump tops and slopes with 2 feet of non-acid generating material. Topsoil will be spread over the capping material in thicknesses ranging from 19 to 24 inches. Finally, herbaceous vegetation will be established by seeding and assorted trees will be planted.

Bond amount $ 23,870,000

(2) **Reclaim Support Facilities** consists of demolishing and disposing the powder magazines and explosive storage area, core shed, pump house, guard house, storage trailers, power lines, pipelines, administration building, welding shop, cold storage, mill and mill tanks, mechanic shop, warehouse assay lab and bunkhouse, crushers, water tanks, drop tower and cable shack. The ground formerly occupied by these buildings will be tested for acidity. If acidic, the soil will be removed and replaced with 6 inches of non-acid generating soil. Finally, herbaceous vegetation will be established by seeding and assorted trees will be planted. If the areas are not acid-producing, then the surfaces will be ripped and 6 inches of soil will be applied before vegetation is reestablished.

Bond amount $ 1,015,000

(3) **Reclaim Miscellaneous Disturbances** includes construction buffer zones, borrow areas and oxide and soil stockpile locations. These areas will be ripped, spread with 6 inches of soil, then reseeded to establish vegetation.

Bond amount $ 902,000

(4) **Reclaim Tailing Impoundments** includes completing reclamation of Tailing Impoundment No.1, and reclaiming Tailing Impoundment No. 2. After final settlement occurs, reclamation includes filling areas that have settled, capping the impoundments with 2 feet of neutral capping material, placing an additional 18 inches of alluvial capping material on unlined Impoundment No. 1, then spreading 2 feet of soil on both impoundments. Vegetation is then established by using the approved seed mix.

Bond Amount $ 5,077,000

(5) **Construct and Maintain Storm Water Diversions** includes revegetating the East Diversion and controlling weeds, and constructing the West Side and Sheep Rock Draw Return Diversions. Costs are included for storm event repairs.

Bond amount $ 625,000

(6) **Reclaim Open Pit** involves backfilling the pit to the 4800-foot level, capping gently sloping areas within the open pit that are safely accessible with 2 feet of oxide material and 2 feet of topsoil, then establishing vegetation by planting assorted trees and grasses. Also, wildlife habitat enhancement structures such as raptor cavities and ledges, and bat caves are constructed.

Bond Amount $ 1,227,000

(7) **Monitoring** costs include 5 years of monitoring after reclamation has been completed. These costs include groundwater and surface water sampling and analysis, and ground movement monitoring during operations.

Bond Amount $ 414,000

(8) **Interim Maintenance** costs are costs that MDEQ would incur if the mine ceased operations without fulfilling its reclamation commitments. An estimated period of 6 months would lapse between the moment operations ceased and a contract is awarded for reclamation. Interim costs that would occur in this time frame are estimated to include water collection and treatment, storm water event repair of diversions, and general maintenance.

Bond Amount $ 110,000

(9) **Water Treatment** costs include capital costs to construct a water treatment plant, and operating and maintenance costs discounted over a 100-year period. These costs also include long-term monitoring of water quality, the construction of capture systems, and pumping costs. Costs for replacement of the systems are included.

Bond Amount $ 20,400,000

Other costs associated with the reclamation of the Golden Sunlight mine include administration (5%), engineering and redesign (3%), mobilization (1%), cost escalation factors (3% for two years), contingency (4%), and reclamation management (2.5%).

Total Estimated Reclamation Cost $ 64,087,000

As noted above, GSM may not implement the agencies' decision to approve the Proposed Plan as modified by the Return Diversion and No Pit Pond alternatives until it has submitted this bond and received operating permit Amendment 010. Bond release may be requested, incrementally, by GSM as its completed activities meet the reclamation standards outlined in the MMRA. When bond release is requested, the agencies will evaluate the request and solicit public comment as required by 82-4-338, MCA, prior to making a decision.

VI. ISSUES AND ALTERNATIVES

The EIS and this ROD have been prepared in response to GSM's applications, the court order, and issues and concerns identified through public comment. Alternatives were developed to address significant issues. These issues and alternatives are summarized below and presented in detail in the EIS. A preferred alternative was identified in the draft EIS and was selected following completion of the final EIS. This decision took into account impacts of the various alternatives as well as public comment and the potential for the alternatives to resolve the issues.

A. Public Scoping and Comment

On September 28, 1995, a news release was issued to newspapers, radio and television stations, and major interest groups announcing the agencies' intention to prepare the EIS. Individual notifications were sent to interested persons, agencies, or groups. A Notice of Intent to prepare the EIS was published in the Federal Register on October 5, 1995. A public scoping meeting held in Whitehall on October 17, 1995, was attended by about 75 to 100 people. Scoping comments were accepted through November 10, 1995. Fifteen comment letters were received.

The Draft EIS was released on November 21, 1997, with the publication of the Notice of Availability in the Federal Register. About 250 copies of the Draft EIS were distributed to the public and other state and federal agencies with an invitation to comment. The Draft EIS presented seven alternatives, including the no action alternative, the company proposed action, and the agencies' preferred alternative. The Draft EIS disclosed the affected environment and the environmental consequences of each alternative.

A public hearing was held in Whitehall on January 5, 1998, and was attended by about 100 people, 28 of whom presented oral comments. The public comment period ended January 21, 1998. Two hundred eighty-nine comment letters were received. Petitions in support of GSM containing over 1300 signatures were also received.

All written and oral comments were reviewed and considered during preparation of the Final EIS. Comments that presented new data, questioned facts or analysis, or raised questions or issues bearing directly on the alternatives or environmental analysis received a response in the Final EIS. Comments expressing personal opinions were considered but drew no response. The Notice of Availability for the Final EIS was published in the Federal Register on April 24, 1998.

B. Issues and Alternatives Development

Section I.B of the EIS describes the issues raised in the court order of September 1, 1994, and during public scoping. The issues and concerns include:

1. Compliance with the 31 stipulations attached to Amendment 008 in the 1990 decision,
2. Potential impacts from waste rock dump slopes constructed and reclaimed at a slope angle of 2:1,
3. Potential impacts from acid water vapor rise in the tailing impoundments and waste rock dumps,
4. Potential impacts to surface water and groundwater quality from ARD and heavy metals,
5. Potential impacts associated with perpetual waste water treatment,
6. Simultaneous reclamation,
7. Reclamation of "objectionable effluent",
8. Pit reclamation, and
9. Reclamation of the permanent water treatment plant, sludge landfill, and miscellaneous facilities.

The following discussion summarizes each issue and how it is addressed in the EIS and/or this decision.

1. Stipulation Compliance

The 31 stipulations to Amendment 008 included mining-impact mitigation measures. Public concerns included questions about the status of GSM's compliance with the stipulations attached to Amendment 008. The status of compliance with the stipulations is presented in Table I-1 of the EIS. GSM has already fulfilled many of the stipulations. Others have been implemented, and work is continuing as shown in Section III of this ROD. Still others cannot be implemented until some time in the future. GSM has incorporated some stipulations into its operating plan as commitments. The agencies' conclusions regarding these stipulations, as a result of the EIS analysis, are present in Section III of this document.

The only Amendment 008 stipulation that will remain in effect is Stipulation 008-3. Section III of this ROD summarizes which Amendment 008 stipulations have been replaced by Amendment 010 stipulations.

2. Waste Rock Dump Slopes

The Court concluded that MDEQ did not show that 2:1 waste rock dump slopes could be reclaimed successfully and did not evaluate the impacts of the failure of reclamation on the steeper slopes. Therefore, the Draft EIS evaluated waste rock dump slopes in greater detail (pages 304 to 309). The Draft EIS's conclusions are summarized below.

Reclamation success of waste rock dump slopes is dependent upon soil erosion rates, and the ability of vegetation communities to establish and maintain themselves under the climatic conditions at the mine. GSM has proposed to reclaim the waste rock dumps at a combination of 2:1 and 3:1 slopes, depending upon the foundations upon which the dumps are built and preexisting slope conditions in that portion of the waste rock dump complex. Dump slopes were evaluated in Section IV.C.1.a of the Draft EIS.

Test plot studies performed since 1991 have shown that 2:1 slopes can be successfully revegetated at Golden Sunlight. Erosion sampling (detailed in annual reports) on the test plots and modeling indicate that soil erosion rates can remain at acceptable levels even on long slopes, if the coarse fragment content of the replaced topsoil is up to 50 percent by volume and has at least 20 percent of the rock over ¾ inch in diameter. Under the selected alternative, GSM will reclaim the waste rock dumps at a combination of 2:1 and 3:1 slopes. The agencies will stipulate that future reclaimed waste rock dump slopes, regardless of inclination, must have vertical distances between benches of no more than 100 feet (see Stipulation 010-18). This will reduce slope lengths to 225 feet on 2:1 slopes and 320 feet on 3:1 slopes and provide additional assurance of reclamation success. The agencies will further stipulate that the coarse fragment content of replaced topsoil will have at least 20 percent coarse fragments over ¾ inch in diameter, unless GSM can demonstrate to the agencies that other methods of erosion control would be at least as effective (see Stipulation 010-15).

The failure modes and effects analysis performed for the EIS indicates that the chance of slope failure due to underlying ground movement on the waste rock dumps and buttresses under the selected alternative is low to moderate. The environmental effect would be the exposure of limited volumes of ARD-generating waste rock because of rupturing of the reclamation cover. Regular monitoring and inspection of reclaimed slopes will be required, and GSM must repair any damage to the waste rock dump covers (see Stipulation 010-2)

The 3:1 Slope Alternative was developed to evaluate the effects of reclaiming the waste rock dumps at 3:1 slopes only. The analysis was presented on page 246 of the Draft EIS.

3. Acid Water Vapor Rise

The Court concluded that MDEQ did not adequately evaluate the effect of acid water vapor rise on revegetation and reclamation success of the tailing impoundments and waste rock dumps.

No alternative was developed specifically to address this issue. Instead, Stipulation 010-14 would be required for any alternative. The impacts of steam venting resulting from acid water vapor rise at existing sites are described in Section IV.C.1 of the Draft EIS.

Venting could cause changes in soil chemistry leading to changes in the vegetation communities.

The agencies will stipulate that GSM monitor the tailing impoundments and waste rock dumps for vapor vents, monitor vent gases, and repair any localized damage that might occur to reclaimed areas (see Stipulation 010-14).

4. Surface Water and Groundwater Quality

The Court concluded that MDEQ did not adequately evaluate the potential impacts to surface water and groundwater quality from ARD and heavy metals migrating out of the waste rock dumps, tailing impoundments, and the pit. Additional analysis is presented in the Draft EIS (pages 248 to 291). The results are summarized below.

The EIS analysis documents the agencies' conclusion that no impacts to water quality from the waste rock are anticipated during mining operations. Modeling predicts that ARD from the existing waste rock dumps will affect groundwater quality, although not for tens to hundreds of years. Added water quality impacts from new waste rock dumps are expected to be negligible compared to the existing conditions. New waste rock would be added to the East Waste Rock Dump complex over the Bozeman Unit which has high buffering capacity. Modeling indicates that the proposed water management plan will prevent ARD impacts from occurring beyond the mixing zone boundary. Springs within the mixing zone could be affected by ARD or groundwater drawdown caused by the capture well system. Mitigation measures were developed to augment or replace impacted springs to allow their use by livestock and wildlife. (See Stipulations 010-4 through 010-13 for mitigation requirements related to water quality.)

Dewatering and consolidation of Tailing Impoundment No. 1 is expected to be complete within 8 to 10 years. Water quality is slightly alkaline, and the tailings water contains cyanide. The cyanide concentration is expected to decrease during the dewatering period, and the water will become acid. After consolidation of the tailings, the impoundment will be capped and revegetated to reduce infiltration of direct precipitation. Stipulation 010-10 requires that the presently permitted 18-inch clay layer in the Tailing Impoundment No. 1 cap will be replaced with 18 inches of agency-approved borrow material. Low quality seepage from the impoundment will be intercepted by the groundwater pumpback well system and treated. Water quality impacts will be restricted to the immediate vicinity of the impoundment and within the mixing zone.

Since Tailing Impoundment No. 2 is lined, any seepage that might develop will come from localized liner failures. The quality of any seepage will be the same as the quality of seepage from Tailing Impoundment No.1. Impacts to groundwater quality are expected to be negligible and will be confined to the mixing zone. After consolidation of the tailings, the impoundment will be capped and revegetated to reduce infiltration of direct precipitation. Stipulation 010-11 requires that any poor quality seepage detected in monitoring wells will be collected and treated.

Water that collects in the pit will produce ARD. During mining, pit water will be pumped and

used in the ore processing circuit. After mining ceases, the Proposed Action calls for allowing the pit to fill with water and pumping to the treatment plant to keep the water level below the contact between the bedrock and the alluvium.

The No Pit Pond Alternative, which is part of the selected alternative, was developed to keep the pit pumped dry after mining ends, avoiding potential problems associated with leaving a lake of poor quality water. Water pumped from the pit will be treated before being discharged.

5. Perpetual Waste Water Treatment

The Court concluded that MDEQ did not adequately evaluate the effectiveness or the potential environmental impacts associated with perpetual waste water treatment.

A permanent water treatment plant will be built to treat water from the pit, seepage from the tailing impoundments, and, eventually, seepage from the waste rock dumps. Contingencies have been provided in the design in case of unexpectedly large amounts of water in need of treatment (see Stipulation 010-9). Waste water will be treated to comply with provisions of the Water Quality Act before being discharged, so no water quality impacts are expected. Sludge from the treatment plant will be disposed of in lined cells on the surface of Tailing Impoundment No. 2 after the tailing has consolidated. The disposal cells will be capped and revegetated after they are filled. Because the cells will be lined and will be built on the lined Tailing Impoundment No. 2, no groundwater impacts are expected from the sludge.

No alternative was developed specifically to address this issue. Waste water treatment would be required under any alternative to comply with the Water Quality Act.

6. Simultaneous Reclamation

The Court directed MDEQ to document that reclamation activities will be completed on completed or abandoned portions of the mine not more than 2 years after completion or abandonment [cessation of operations], or to issue an order granting an extension from the 2-year statutory period as required by MMRA. The EIS presents an expanded discussion of the timing of reclamation activities.

All facilities except the tailings impoundment will be reclaimed within 2 years of their abandonment. The tailing impoundments will be reclaimed within 2 years after tailings consolidation is complete (see Stipulation 010-19). As portions of the tailing impoundments become consolidated, the accessible parts will be reclaimed.

Simultaneous reclamation is required by MMRA and applies to any alternative. A separate

alternative was not needed to address this issue.

7. Reclamation of "Objectionable Effluent"

The Court found that the reclamation plan in place in 1990 violated MMRA in that the plan did not provide for reliable evaluation of the potential for groundwater contamination from the pit, tailing impoundments, and waste rock dumps, and did not guard against such contamination. An expanded analysis and discussion of the potential for groundwater contamination is presented in the EIS.

MMRA requires that when an open pit of 2 acres or more is likely to produce objectionable effluent when moisture contacts the pit walls or floor, the reclamation plan must include:

a) Insulation of all faces from moisture or water contact by covering to a depth of 2 feet or more with material or fill not susceptible itself to generation of objectionable effluents;

b) Processing of any objectionable effluents in the pit before they are allowed to flow or be pumped out of the pit to reduce toxic or other objectionable ratios to a level considered safe to humans and the environment by the department;

c) Drainage of any objectionable effluents to settling or treatment basins when the objectionable effluents must be reduced to levels considered safe by the department before release from the settling basins; or

d) Absorption or evaporation of objectionable effluents in the open pit itself.

The impact evaluation in the EIS indicates that, regardless of whether mining ceases or continues, there is a potential for groundwater contamination from effluents generated by past as well as future mining. The Proposed Action and the No Pit Pond (the selected alternative) and Partial Backfill alternatives would control pit water after mining by pumping excess water to the treatment plant. Under its water management plan, GSM will monitor for groundwater contamination down gradient of the waste rock dumps and tailing impoundments and collect any seepage for treatment (see Stipulations 010-7 and 11). Groundwater contamination will stay within the mixing zone boundary because of the measures required by the stipulations.

8. Pit Reclamation

The Court found that Section 82-4-336(7) of MMRA, as it read before the 1995 amendment by the legislature, was unconstitutional in that it did not require reclamation of open pits and rock faces that may not be feasible to reclaim. The Court also found that MDEQ should have

evaluated the feasibility of reclaiming the pit.

The Proposed Action reclamation plan would cap and revegetate those portions of the pit that would be accessible to equipment after mining ceases, about 19 acres. The Partial Backfill Alternative was developed to analyze pit backfilling as a reclamation alternative that would eliminate the highwall and cover all acid-producing rock within the pit. The No Pit Pond Alternative was developed to analyze the reclamation alternative of eliminating formation of the pit lake and preventing groundwater from contacting the reactive pit walls. This alternative represents a course of reclamation between the Proposed Action and the Partial Backfill Alternative.

In response to the Court's action, the 1995 Legislature amended 82-4-336(7) to read as follows:

> "The reclamation plan must provide for the reclamation of all disturbed land. Proposed reclamation must provide for the reclamation of disturbed land to comparable utility and stability as that of adjacent areas, except for open pits and rock faces that may not be feasible to reclaim in the same fashion as other disturbed lands. In the case of open pits and rock faces, the reclamation plan must provide for reclamation to a condition:
>
> (a) of stability structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment;
>
> (b) that affords utility to humans and the surrounding natural system to the extent feasible; and
>
> (c) that blends with the appearance of the surrounding area to the extent feasible."

This subsection was passed by the Montana Legislature in 1995 in Chapter 464, Laws of 1995.

MDEQ's decision is to approve the Proposed Action and impose the No Pit Pond Alternative, which requires backfilling to the 4,800-foot level. Under this alternative, an area of about 8 acres in the bottom of the pit would be backfilled, capped, and revegetated. The highwalls will be structurally stable and should not pose a threat to public safety, although minor raveling and slumping of highwalls will occur over time. The revegetated area will be used by wildlife. Cavities constructed in the highwalls will be used for nesting by raptors and bats. Visual impacts would be reduced slightly by capping and revegetating pit benches where feasible, about 19 acres.

Comparable utility to humans and the surrounding natural system and further blending with the appearance of the surrounding area could only occur under the Partial Backfill Alternative. MDEQ has determined that the Partial Backfill Alternative is not feasible. The rationale for this decision is contained below in the section that describes compliance with the Metal Mine Reclamation Act.

9. Reclamation of the Permanent Water Treatment Plant, Sludge Landfill, and Miscellaneous Facilities

The Court found that the 1990 reclamation plan does not provide for reclamation of the permanent water treatment plant, sludge landfill, and other miscellaneous facilities. GSM modified its plan to provide more detail. This plan was described in the Draft EIS on page 71.

The reclamation plan in the selected alternative covers the reclamation of facility areas including the water treatment plant. Buildings and equipment will be dismantled and removed after they are no longer needed. Associated disturbed areas will be revegetated unless they are to be left for a future use. Sludge disposal cells will be covered with geomembrane after they are filled. Soil will be spread over the geomembrane, and the site will be revegetated (see Appendix C of the Draft EIS).

This reclamation requirement would apply to any alternative. A separate alternative was not needed to address this issue.

C. Alternatives Considered in Detail

Chapter II of the Draft EIS describes the alternatives analyzed and the alternatives excluded from detailed analysis. The alternatives and their key components are summarized below and were analyzed in detail.

Primary Alternatives

* Discontinued Mining After the Interim Dump Plan (No Action Alternative)
* Continued Mining Beyond the Interim Dump Plan (Proposed Action)

Secondary Alternatives Associated with the Proposed Action

* Continued Mining with a Permanent Diversion Structure Routing Sheep Rock Creek Around the East Waste Rock Dump (Return Diversion Alternative)
* Continued Mining with a Divided East Waste Rock Dump, Leaving Sheep Rock Creek

in its Original Channel (Divided Dump Alternative)

Reclamation Alternatives Applicable to Either the No Action Alternative or the Proposed Action

* Reclamation Requiring Reduced 3:1 Waste Rock Dump Slopes (3:1 Slope Alternative)
* Reclamation Requiring Measures to Prevent Surface Water from Collecting in the Pit (No Pit Pond Alternative)
* Reclamation Requiring Partially Backfilling the Pit (Partial Backfill Alternative)

D. Environmentally Preferred Alternative

The No Action Alternative in combination with the Partial Backfill Alternative is the environmentally preferred alternative. Mining would cease when currently permitted waste rock dump space is exhausted. There would be no new surface disturbance. The amount of potentially ARD-producing waste rock would not increase. Sheep Rock Creek would not be disturbed, and its natural function would be preserved. Partially backfilling the pit would better provide for structural stability, utility to humans and the surrounding natural system, and blending in appearance with the surrounding area. Rock walls capable of producing objectionable effluents would be insulated with backfill material and the reclamation cap. More of the disturbed area would be revegetated. Groundwater in an amount similar to the Proposed Action would still need to be captured and treated.

VII. Rationale for the Decisions

A. Rationale for the Selected Alternative

The preferred alternative identified in the Final EIS has been selected by BLM for implementation. A mine expansion alternative has been chosen to address the operator's mineral development proposal in accordance with private property rights, public land law, and agency land use plans. All practical means to avoid or minimize environmental harm have been included in the selected alternative. Reclamation covers have been selected that enhance the potential for long-term reclamation success and reduce the potential for surface water to infiltrate into the reclaimed facilities. These measures, together with other mitigation, are used to prevent unnecessary or undue degradation, and provide for comparable stability and utility of mined lands with adjacent areas. However, some impacts are unavoidable. This is the case for resource components such as aesthetics, soils, vegetation, and wildlife habitat.

MDEQ has selected for permitting the preferred alternative, the Proposed Action as modified by the Return Diversion and No Pit Pond alternatives, after considering the potential impacts of all of

the alternatives. The Return Diversion Alternative requires that Sheep Rock Creek be diverted around the East Waste Rock Dump, instead of into the Conrow Creek drainage. The No Pit Pond Alternative requires that the pit be kept dry after the end of mine life instead of being allowed to fill with water. The selected alternative minimizes the adverse environmental impacts while allowing continued mining and reducing the potential of foreclosing future mining opportunities. MDEQ recognizes that none of the alternatives, including the selected alternative, completely avoids environmental impact.

B. Selected Alternative Compliance with Legal and Policy Mandates

This section explains how the selected alternative satisfies the agencies' major statutory, regulatory, and policy mandates.

National Mineral Policy Conformance

The Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976 (FLPMA), and the Natural Materials and Minerals Policy, Research and Development Act of 1980 direct that the public lands be managed in a manner which recognizes the Nation's need for domestic sources of mineral production. Under the Mining Law of 1872 claimants have a statutory right to develop their mineral deposits consistent with applicable environmental laws.

The preferred alternative provides for continued domestic mineral production of gold from the Golden Sunlight Mine. The preferred alternative was selected by BLM because it provides for the unpatented and patented mining claim holders developing their mineral deposits consistent with the environmental laws of the State of Montana and the United States.

Prevention of Unnecessary or Undue Degradation

Section 302(b) of FLPMA amended the Mining Law of 1872 and directed the Secretary of the Interior to: "...prevent unnecessary or undue degradation of the lands." Unnecessary or undue degradation was not defined in FLPMA but was defined in the implementing regulations at 43 CFR 3809 as: (1) surface disturbance greater than what would normally result when activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character; (2) failure to take into consideration the effects of the operations on other resources and land uses, including those resources and uses outside the area of operations; (3) failure to initiate and complete reasonable mitigation measures, including reclamation of disturbed areas or creation of a nuisance; (4) failure to comply with applicable environmental statutes and regulations.

Four of the alternatives evaluated have nearly identical acres of disturbed lands, approximately 2,965 acres. The alternatives range from 2,743 to 3,078 acres. The selected alternative addresses

the first requirement above by limiting surface disturbance to 2,964 acres and also by limiting the disturbance to existing drainage areas that already have been impacted by the mine. Conducting mine operations under the selected alternative will therefore satisfy the prudent operator requirement.

The selected alternative addresses the second requirement by taking into consideration the effects of the operations on other resources and land uses both on and off site. The selected alternative includes measures to reduce or avoid impacts to geology (slide block movement), water resources, soils and reclamation, wetlands, wildlife and fisheries resources, cultural resources and Native American concerns. These measures are described in detail in Chapter II of the Draft EIS and in the mitigations stipulated as part of this alternative. These measures are also discussed in the EIS Summary document.

The selected alternative addresses the third requirement by including reasonable mitigation for adverse impacts and by requiring reclamation of lands disturbed by past and future mining. Mitigation is used to reduce the impacts of the following to less than significant. The Draft EIS has determined that the reclamation plans in the selected alternative will be highly successful at re-establishing plant communities in the disturbed areas, at limiting long-term infiltration of precipitation into mine waste, and at maintaining stability of the reclaimed surfaces. These reclamation plans meet or exceed the performance requirements for reclamation covers used not only elsewhere in the mining industry, but in the hazardous waste/landfill sectors as well.

The selected alternative addresses the fourth requirement for preventing unnecessary or undue degradation by including measures needed to comply with applicable environmental laws and regulations, specifically, measures to ensure compliance with the water quality laws. Source controls to limit the generation of ARD from mined materials are included in combination with water monitoring, water capture and water treatment measures under the selected alternative. These measures will provide for existing operations to meet water quality standards and prevent expanded operations from violating water quality standards.

In conclusion, the expanded mining and reclamation plans for the Golden Sunlight Mine in the selected alternative will not result in unnecessary or undue degradation of federal lands, both on and off site. The selected alternative therefore satisfies the requirements of the Federal Land Policy Management Act.

Land Use Plan Conformance

The majority of public lands in the Headwaters Resource Area are open to operation of the Mining Law in conformance with the Headwaters Resource Management Plan EIS. Approval of a Plan of Operations by BLM on lands open to mineral entry is nondiscretionary (i.e., BLM must approve such a plan) if it will not cause unnecessary or undue degradation.

Since the preferred alternative does not result in unnecessary or undue degradation it has been selected for implementation and the Modified Plans of Operations approved. This alternative is consistent with the Hardrock Mineral Section of the Headwaters Resource Management Plan EIS.

Executive Order 12898 on Environmental Justice

On February 11, 1994, President Clinton signed Executive Order 12898 that requires federal agencies to address issues of Environmental Justice when implementing their respective programs.

Public scoping and public participation throughout the EIS process involving the geographic area and local population impacted by the proposed action did not reveal any issues related to Environmental Justice. The agencies have considered all public input from persons or groups regardless of age, race, income status, or other social/economic characteristics. The Golden Sunlight Mine Expansion Project was evaluated using the appropriate Environmental Justice criteria and no disproportionately high or adverse human health or environmental effects were identified for minority or low-income populations.

Religious Freedom Restoration Act

The Religious Freedom Restoration Act of 1993 requires that before a government action may substantially burden a person's exercise of religion the government must demonstrate its action is (1) in furtherance of a compelling government interest; and (2) is the least restrictive means of furthering that interest. In public scoping and public participation throughout the EIS process this issue has not been raised. The Golden Sunlight Mine Expansion Project will not burden the exercise of religion for either Native Americans or others.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act was passed as a joint resolution of Congress. The resolution states that it shall be the policy of the United States to protect and preserve for the American Indian the inherent right of freedom to believe, express and exercise their traditional religions, to use of sacred objects and to worship through ceremonies and ritual. BLM complies with this act by consulting with and considering the views of Native Americans when a proposed land use might conflict with traditional Native American religious beliefs or practices. The act does not require that land uses which conflict with Native American religious beliefs or practices be denied.

There have been no conflicts with Native American religious beliefs or practices identified through the public participation process. The Golden Sunlight Mine Expansion Project will not impact traditional religious beliefs or practices.

National Historic Preservation Act

BLM has completed the process for considering the effect of the undertaking on Historic Properties as required by Section 106 of the National Historic Preservation Act. Affected Indian tribes have been consulted and their concerns have been satisfactorily addressed. All adverse impacts have been avoided through protective measures and/or project design.

Montana Metal Mine Reclamation Act

The purpose of MMRA is to provide that the usefulness, productivity, and scenic value of mined land receive "the greatest reasonable degree of protection and reclamation to beneficial use". It also recognizes that the degree of reclamation is controlled by its practicability. MMRA requires the establishment, on a continuing basis, of vegetative cover, soil stability, water conditions and safety conditions appropriate to the proposed post-mining land use.

At GSM, the post-mining land use will be wildlife habitat and livestock grazing. Reclamation will support this land use to a reasonable degree as required by MMRA and as summarized below, from the EIS, and from GSM's reclamation plan.

Reclamation of portions of the mine complex will be performed concurrently with other mining activities as much as possible. Reclamation of each portion will be finished within 2 years after abandonment. The tailing impoundments will be considered abandoned when the tailing is finally consolidated, 8 to 10 years after the last tailing has been deposited. Portions of the south waste rock dumps have been regraded, capped, and revegetated. This reclamation work will continue as various parts of the waste rock dumps reach capacity and are decommissioned. Preliminary reclamation has begun on Tailing Impoundment No. 1. This work will continue as tailing consolidation continues.

GSM may not depart from the approved reclamation plan without first obtaining written approval of the proposed change from the agencies.

To avoid the accumulation of stagnant water, pit water is presently pumped and treated and used in the mill circuit. After mine closure, the selected alternative will require GSM to backfill the bottom of the pit to avoid stagnant water accumulation. Water that accumulates in the backfill will be pumped and treated until the water's quality complies with state standards.

The waste rock dumps will be regraded to a combination of slope angles that mimics the surrounding natural slopes. The waste rock dumps and tailing impoundments will be capped with neutral waste rock, subsoil, and topsoil and revegetated. The capping material will be non-noxious, nonflammable, and noncombustible solids. The waste rock dump cap is designed to reduce infiltration of precipitation into the acid-producing waste rock and to minimize erosion.

The reclaimed vegetation will be a mixture of grasses and forbs with some shrubs and trees. This community will have a function and general appearance similar to the surrounding natural vegetation. There will be no sanitary landfill on the mine site.

In the case of open pits, reclamation must ensure that the highwalls are structurally stable, that the pit area will be useful to humans and the surrounding natural system to the extent feasible, and that the pit area blends in appearance with its surroundings to the extent feasible. Objectionable effluents that might form in the pit must be controlled.

Under GSM's proposal, the highwall would be structurally stable. Approximately 19 acres of pit bench would be revegetated. Nesting cavities for raptors and bats would be constructed in the highwalls. A lake approximately 38 acres in size would form in the bottom of the pit. This lake would be toxic to waterfowl and wildlife. Water would be pumped from the pit and treated so that no violations of provisions of the Water Quality Act in either surface water or groundwater would occur outside of the pit. No air quality violations would occur. Under the No Pit Pond Alternative, the negative effect on birds and wildlife of the toxic pond would be eliminated. In addition, approximately 8 acres in the bottom of the pit would be revegetated. The Partial Backfill Alternative would achieve the same benefit as the No Pit Pond Alternative. In addition, another 235 acres would be revegetated. The Partial Backfill and No Pit Pond alternatives would afford more utility to humans and the surrounding natural system. The Partial Backfill Alternative would better blend the pit area with the appearance of the surrounding area. Section 82-4-336(7) therefore requires MDEQ to impose the Partial Backfill Alternative, if it is feasible. If the Partial Backfill Alternative is not feasible, and the No Pit Pond Alternative is feasible, MDEQ is required to impose this latter alternative.

In the statement of intent for Chapter 464, Laws of 1995, the legislature indicated that MDEQ is to consider and give effect to each of the following objectives in determining the feasibility of reclamation beyond structural stability and water treatment:

(1) to encourage mining as an activity beneficial to the economy of our state;

(2) to encourage the production of minerals to meet the needs of society and the economic demands of the marketplace;

(3) to encourage reclamation to a condition that is aesthetically unobtrusive;

(4) to encourage reclamation to functional use;

(5) to discourage requirements that may foreclose future access to mineral resources not fully developed by current mining operations;

(6) to discourage requirements that will generate undesirable offsite environmental impacts.

It appears that, with a partial backfill requirement, GSM would not achieve a positive return on investment unless the price of gold were to be approximately $400 per ounce for the remainder of mine life. This sustained price rise is not projected to occur. However, in order to generate cash flow and thereby minimize investment loss, GSM would most likely continue to mine even if the Partial Backfill Alternative were imposed. GSM would, however, most likely mine less of the reserve if the partial backfill requirement were imposed because it would reach the point of unacceptable cash flow sooner. Approximately 1,224,000 ounces of proven reserves can reasonably be expected to be recovered without a pit backfill requirement. With a partial backfill requirement, approximately 400,000 ounces most likely would not be recovered due to cash flow considerations. In addition, partial backfilling would significantly decrease the possibility that approximately 235,000 ounces of reserves below the proven reserves would be mined in the future because the reserves would be covered by approximately 55 million tons of backfill material.

Imposition of the partial backfill requirement would not encourage mining, would not encourage production of minerals, and may foreclose future access to remaining reserves. It would encourage reclamation to a condition that is less aesthetically obtrusive and encourage reclamation to a functional use. The Partial Backfill Alternative discourages undesirable offsite impacts.

Approval of the no pit pond pit reclamation alternative encourages mining and encourages the production of minerals. Because only 100 feet (about 750,000 tons) of backfill would be placed in the pit, this alternative does not foreclose future access to mineral resources that would not be mined under the existing proposal. Although not to the extent of the Partial Backfill Alternative, it encourages reclamation to a condition that is aesthetically unobtrusive to the same degree as the GSM proposal by revegetating approximately 19 acres of pit bench. It does encourage reclamation to functional use, although less so than the Partial Backfill Alternative, because the negative impact of the pit pond is eliminated and 8 additional acres are revegetated. The No Pit Pond Alternative discourages undesirable offsite impacts.

After weighing all the factors listed in the statement of intent, MDEQ has determined that partial backfilling is not feasible under 82-4-336(7), and that the No Pit Pond Alternative is feasible.

Some raveling, talus formation, and limited rock mass movement of the highwall can be expected over the long term after mine closure. These occurrences will lead to increased stability of the highwall with little impact on the environment. Berms at the base of the pit walls will protect maintenance workers from falling rock. The perimeter of the pit will be bermed and fenced to restrict access by livestock and the public.

Noxious weeds will be controlled until the agencies decide that revegetation has been successful,

and the bond is released.

ARD is expected to affect the quality of groundwater downgradient of the waste rock dumps, pit, and tailing impoundments sometime after the mine closes. According to the statement of basis for the mixing zone, the proposed water management plan will be effective in collecting and treating at least part of the contaminated groundwater. Stipulations 010-4 through 010-13 will provide additional safeguards to make sure that contaminated groundwater does not pass the mixing zone boundary.

MMRA requires that the reclamation plan provide sufficient measures to prevent the pollution of air and water. GSM's compliance with the Montana Water Quality Act, the Montana Pollutant Discharge Elimination System, and the Montana Air Quality Act is described below.

Montana Water Quality Act

The operating plan, reclamation plan, and water management plan will effectively control the discharge of pollutants. Infiltration into the waste rock dumps and tailing impoundments will be minimized by capping and revegetating their surfaces. Groundwater contaminated by seepage from the West Waste Rock Dump and from Tailing Impoundment No. 1 will be detected in monitoring wells and captured for treatment to comply with the provisions of the Water Quality Act before being discharged. Groundwater contaminated by seepage from the East Waste Rock Dump is expected to comply with the provisions of the Water Quality Act by the time it reaches the mixing zone boundary designated in the statement of basis in the Final EIS. Objectionable effluent from the pit will be controlled by pumping water that accumulates in the backfill and treating it to comply with the provisions of the Water Quality Act before being discharged.

MDEQ completed a significance determination with regard to groundwater quality degradation. This determination is summarized in the statement of basis for the mixing zone (EIS Appendix 1).

Montana Pollutant Discharge Elimination System

An MPDES Permit is required for all discharges to surface water or groundwater. GSM holds two General Discharge Permits: MTR 300199 (issued December 7, 1994) for active mine areas and MTR 300012 (issued August 25, 1993) for inactive mine areas. GSM also has an approved Storm Water Pollution Prevention Plan.

Clean Water Act

Under Section 404 of the Federal Clean Water Act, GSM must obtain a permit to place waste rock in drainages that are considered "waters of the US". Under Section 401 of the Act, MDEQ

must either certify that the action will comply with state law or waive such certification. MDEQ has waived certification.

Montana Air Quality Act

GSM holds air quality permit #1689-04. Emissions from mining activity have been within ambient air quality standards. Since the level of mining activity will not change under the selected alternative, predicted emission levels will not exceed air quality standards.

Montana Hard Rock Impact Act

The Golden Sunlight Mine was originally permitted before passage of the Hard Rock Impact Act. Thus, GSM is not required to have a Hard Rock Impact Plan.

MEPA/NEPA Cumulative Effects Assessments

Chapter IV of the EIS provides a cumulative effects analysis. There are no related future actions under concurrent consideration, and no reasonably foreseeable future actions, that, when considered in conjunction with past and present actions, are likely to result in additional significant impacts. Should future actions be proposed which have or may have cumulative effects, additional analysis pursuant to the applicable requirements of MEPA and NEPA would be conducted by the agencies.

Private Property Assessment Act

Imposition of the No Pit Pond and Return Diversion alternatives and the stipulations described above does not have taking or damaging implications.

VIII. Monitoring and Compliance

This section summarizes the project monitoring that will be conducted. The purpose of monitoring is to ensure compliance with the terms and conditions of the approved mining and reclamation plans, to detect problems early, and to provide a basis for directing remediation of unanticipated problems.

A. Agency Monitoring

Agency staff will conduct compliance inspections at least quarterly under the authority of MMRA

and FLPMA. These inspections will be comprehensive mine-wide inspections. Inspections will consist of examination of disturbed areas, verification sampling at water quality monitoring points, and geochemical sampling of mine products, construction materials, and reclamation materials. Revegetation will be examined annually. More frequent inspections could be conducted during periods of intense activity in particular areas of the mine, or when compliance problems have been noted and corrective measures are being implemented. Additional inspections for compliance with the Montana Water Quality Act and the Montana Air Quality Act will also be conducted. The results of these inspections will be available in agency files.

B. Operator Monitoring Reports

The following monitoring reports are required from GSM under the selected alternative. All reports are to be submitted to both MDEQ and BLM and will be available in the agencies' files.

Geodetic Monitoring Programs

Monthly reports of monitoring to detect ground movements associated with the landslide blocks and movements associated with the East Waste Rock Dump will be submitted during operations. Data from the monitoring of inclinometers and piezometer will be reported annually. If any movement is detected, the agencies will be notified promptly and monitoring intervals and reporting frequencies increased if needed (see Stipulations 010-1 and 2).

Early warning of plant site movement is being provided by the Rattlesnake and Sunlight Block monitoring in Stipulation 010-1. Weekly and monthly reports on the stability monitoring program for the ore processing facilities are required by the existing permit. Reclamation monitoring after operations will ensure maintenance of cover systems and erosion controls (see Stipulation 010-2)

Wildlife Mortality

Reports on wildlife mortality at the mine are required. These reports identify species, number, cause of death, and proposed changes to prevent reoccurrence. Summary reports are submitted annually.

Annual Water Resources Monitoring Report

This report is submitted yearly and includes the results of all water resources monitoring specified in the operating plan for the entire year. This report also includes a summary of past annual monitoring results and trend analysis.

Annual Operating and Reclamation Status Report

This is the annual report required by MMRA. The annual report describes overall mining and reclamation status. This report will include GSM's tracking of the status and progress in complying with the agency-imposed stipulations.

IX. Appeal Processes

The decisions in this ROD may be appealed under certain conditions.

A. Appeals of the BLM Decisions

The authority of the BLM to approve the Plans of Operations subject to the above listed stipulations is limited to the BLM-administered lands in the project area. These decisions may be appealed by either the operator (GSM) or by the public (third party). The following appeals processes apply:

Operator Appeals

Operators have the right to appeal to the Montana State Director, Bureau of Land Management, in accordance with 43 CFR 3809.4. If the operator exercises this right, the appeal, accompanied by a statement of reasons and any arguments which would justify reversal or modification of the decision, must be filed in writing with the BLM Headwaters Resource Area Office within 30 days after receipt of the decision. The decision will remain in effect during the appeal unless a written request for a stay is granted.

Third Party Appeals

Any party, other than the operator, aggrieved by a decision of the authorized officer, may appeal to the Interior Board of Land Appeals, Office of Hearings and Appeals, in accordance with the appeals procedures in 43 CFR, part 4, and the enclosed Attachment 2 (Form 1842-1). If an appeal is taken, a notice of appeal must be filed with the Headwaters Resource Area Office within 30 days after receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error. The filing of such an appeal shall not stop the authorized officer's decision from being effective.

B. Appeals of the MDEQ Decisions

Under Montana state law, this record is subject to court appeal by the applicant and other parties for 90 days after issuance of the operating permit amendment. Notice of permit issuance will be published in the Whitehall Ledger and the Butte Montana Standard.

X. APPROVALS

This Record of Decision is effective for each agency upon signing by its respective agency official.

Mark A. Simonich

Mark A. Simonich, Director
Montana Department of Environmental Quality

6/30/98
Date

Merle Good

Merle Good, Area Manager, Headwaters Resource Area
Bureau of Land Management
(for the Authorized Officer)

6/30/98
Date

Attachments: Incremental Bond Schedule
BLM Cultural Resource Compliance Documentation
Outline of Appeal Procedures, Form 1842-1

Q[redacted] Mine/Operating Permit #00085
A[redacted] - First Reclamation Bond
In[redacted]ond Schedule
Task Summary and Costs

Bond Paid on
Bonded for disturbance through

Task Summary	Jun-98 Bond Requirement	Jun-98 Jun-2000 Bond Requirement	Jun-2000 Jun-2001 Bond Requirement	Jun-2001 Jun-2002 Bond Requirement	Jun-2002 Jun-2003 Bond Requirement	July-2003 Jun-2004 Bond Requirement	Jun-2004 Jun-2005 Bond Requirement	Jun-2005 Jun-2006 Bond Requirement	Jun-2006 Jun-2007 Bond Requirement	Jun-2007 Jun-2008 Bond Requirement	Jun-2008 Bond Requirement	Reclamation Bond Requirement
Item 1 Reclaim Waste Rock Dumps	$18,448,000	$2,304,000	$691,000	$548,000	$446,000	$203,000	$91,000	$6,000	$414,000	$286,000	$148,000	$23,870,000
Item 2 Facilities Reclamation	$1,015,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,015,000
Item 3 Reclaim Miscellaneous Disturbance Acres	$633,000	$23,000	$248,000	$0	$0	$0	$0	$0	$0	$0	$0	$902,000
Item 4 Reclaim Tailing Impoundments	$4,302,000	$107,000	$106,000	$86,000	$85,000	$79,000	$79,000	$69,000	$70,000	$84,000	$0	$5,077,000
Item 5 Construct and Maintain Storm Water Features	$445,000	$180,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$625,000
Item 6 Reclaim Pit	$702,000	$0	$0	$0	$0	$0	$0	$525,000	$0	$0	$0	$1,227,000
Item 7 Monitoring	$414,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$414,000
Item 8 Interim Maintenance & Shutdown	$110,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$110,000
Yearly Requirment	$26,069,000	$2,704,000	$1,343,000	$638,000	$529,000	$282,000	$170,000	$600,000	$484,000	$360,000	$148,000	$33,240,000
Yearly Bond Amount	$26,069,000	$28,773,000	$30,018,000	$30,851,000	$31,176,000	$31,458,000	$31,628,000	$32,228,000	$32,712,000	$33,062,000	$33,240,000	
Mobilization 1.0%	$261,000	$27,000	$12,000	$6,000	$5,000	$3,000	$2,000	$6,000	$5,000	$4,000	$1,000	$332,000
Engineering and Redesign 3.0%	$783,000	$81,000	$37,000	$19,000	$16,000	$8,000	$5,000	$18,000	$15,000	$11,000	$4,000	$997,000
Reclamation Management 2.5%	$652,000	$68,000	$31,000	$16,000	$13,000	$7,000	$4,000	$15,000	$12,000	$9,000	$4,000	$831,000
Contingency 4.0%	$1,043,000	$108,000	$50,000	$25,000	$21,000	$11,000	$7,000	$24,000	$18,000	$15,000	$6,000	$1,330,000
Administration 5.0%	$1,304,000	$135,000	$62,000	$32,000	$26,000	$14,000	$9,000	$30,000	$24,000	$18,000	$7,000	$1,662,000
Inflation Cost Adjustment 3.0%		$663,000	$638,000	$958,000	$994,000	$998,000						$4,727,000
Yearly G&A Requirement	$4,043,000	$1,283,000	$1,131,000	$1,057,000	$1,057,000	$1,023,000	$27,000	$93,000	$75,000	$58,000	$22,000	$9,879,000
Total Yearly Requirement	$30,112,000	$3,987,000	$2,374,000	$1,692,000	$1,582,000	$1,306,000	$197,000	$693,000	$559,000	$438,000	$170,000	$43,119,000
Yearly Total Land Reclamation Bond Amoun	$30,112,000	$34,099,000	$36,473,000	$38,165,000	$39,757,000	$41,062,000	$41,258,000	$41,951,000	$42,511,000	$42,948,000	$43,118,000	$43,119,000
Yearly Total Water Treatment Bond	$20,400,000	$20,400,000	$20,400,000	$20,400,000	$20,400,000	$20,400,000	$20,400,000**	$20,400,000**	$20,400,000**	$20,400,000**	$20,400,000**	$20,400,000**

Inflation Worksheet

2,704,000@1)= $81,000
26,069,000@1)= $782,000
$863,000

Formula: $[1..]n] = [(1+i1)...(1+i[n-1])$

1,243,000@1,2)= $79,000
28,773,000@2)= $863,000
$938,000

525,000@1,2,3)= $99,000
30,561,000@4)= $920,000
$994,000

282,000@1,2,3,4,5)= $45,000
31,176,000@6)= $938,000
$980,000

ENR Construction Cost Index:		Interest rate
March 1998	5675	
*March 1999	6051	3.0%
*March 2000	6233	3.0%
*March 2001	6420	3.0%
*March 2002	6612	3.0%
*March 2003	6811	3.0%

*Note Bond assumes a constant inflation rate of 3 percent. However, the ENR Construction Cost Index will be used as the economic indicator to determine actual inflation. This adjustment will be calculated by DEQ annually.
**Note Water Treatment Bond will be re-evaluated every five years

THE "GREEN SHEET"
CULTURAL RESOURCE COMPLIANCE DOCUMENTATION
BUTTE DISTRICT BLM

Project Name Golden Sunlight Mine Permit Expansion
Cultural Resource Inventory/Project Number Various
EA/CX/BLM Case File Number EIS#97-38; BLM-MT-PL-98-003+1990
NHPA's Section 106 Status:
[x] Section 106 process completed.
[x] Mitigations/stipulations are required (see below).

STIPULATIONS

The proposed permit expansion will have no effect on significant cultural properties (historic and prehistoric sites), provided that the stipulations as identified below are applied to the permit. These stipulations are pursuant to the understanding reached by BLM through consultation with the Montana SHPO.

Stipulation 1. Golden Sunlight Mine (GSM) shall mitigate indirect effects to cultural properties caused by the unauthorized collecting of artifacts by: (a) limiting access to cultural properties located on GSM land; (b) educating their employees as to the fragile nature of cultural resources and the importance of protecting them; and (c) developing a strict management policy that prohibits the casual collecting of artifacts from project and nearby lands.

Stipulation 2. The 1985 Memorandum of Agreement between the State of Montana and GSM with respect to the management of the Sheep Rock Spring Site (24JF292/24JF712) shall be continued.

Stipulation 3. An exclusion zone shall be delineated around all seven talus pits (site numbers 24JF1062; 24JF1063; 24JF1073; 24JF1089; 24JF1090; 24JF1097; and 24JF1123). The exclusion zone shall encircle the talus pits with the closest distance to any one pit being no less than 50 meters or approximately 150 feet. GSM personnel can enter the exclusion zone only after having received expressed permission from the appropriate BLM manager.

Stipulation 4. If constructed, the boundaries of the proposed borrow pit immediately east of Tailing Impoundment No. 2 shall be reconfigured so as to avoid affecting site 24JF1095. The site shall also be encircled with wooden posts as a precaution against inadvertent damage.

Stipulation 5. The proposed haul road east of the plant site facilities shall be designed and constructed by GSM so as to avoid affecting site 24JF944. GSM shall also encircle the site with wooden posts as a precaution against inadvertent damage.

Stipulation 6. In the event the proposed expansion's Divided Dump alternative as described in the Environmental Impact Statement is selected, the 50-acre parcel of State land in Section 36 of T2N and R4W shall be inventoried to BLM Class III (100% coverage) inventory standards. Potential adverse effects to any historic or prehistoric site that may be located in the parcel shall be avoided through project redesign; or, mitigated as determined appropriate through consultation with the Montana SHPO and other interested parties as appropriate.

Signature Darrell Sanders Date February 5, 1998
Title Archaeologist, HRA

Form 1842-1
(February 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

INFORMATION ON TAKING APPEALS TO THE BOARD OF LAND APPEALS

DO NOT APPEAL UNLESS

1. This decision is adverse to you,

AND

2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL . . . . Within 30 days file a *Notice of Appeal* in the office which issued this decision (see 43 CFR Secs. 4.411 and 4.413). You may state your reasons for appealing, if you desire.

2. WHERE TO FILE NOTICE OF APPEAL . . . Interior Board of Land Appeals
4015 Wilson Boulevard
Arlington, Virginia 22203

SOLICITOR ALSO COPY TO . . . . U.S. Department of the Interior
Office of the Solicitor
P.O. Box 31394
Billings, MT 59107-1394

3. STATEMENT OF REASONS . . Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior. Office of the Secretary, Board of Land Appeals, 4015 Wilson Blvd., Arlington, Virginia 22203 (see 43 CFR Sec. 4.412 and 4.413). If you fully stated your reasons for appealing when filing the *Notice of Appeal*, no additional statement is necessary.

SOLICITOR ALSO COPY TO . . . . Same as above.

4. ADVERSE PARTIES . . . . Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor or Field Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal*, (b) the Statement of Reasons, and (c) any other documents filed (see 43 CFR Sec. 4.413). Service will be made upon the Associate Solicitor, Division of Energy and Resources, Washington, D.C. 20240, instead of the Field or Regional Solicitor when appeals are taken from decisions of the Director (WO-100).

5. PROOF OF SERVICE . . . . Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of the Interior, Office of the Secretary, Board of Land Appeals, 4015 Wilson Blvd., Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (see 43 CFR Sec. 4.401(c)(2)).

Unless these procedures are followed your appeal will be subject to dismissal (see 43 CFR Sec. 4.402). Be certain that all communications are identified by serial number of the case being appealed.

NOTE: *A document is not filed until it is actually received in the proper office (see 43 CFR Sec. 4.401(a))*

Sec. 1821.2–1 *Office hours of State Offices.* (a) State Offices and the Washington Office of the Bureau of Land Management are open to the public for the filing of documents and inspection of records during the hours specified in this paragraph on Monday through Friday of each week, with the exception of those days where the office may be closed because of a national holiday or Presidential or other administrative order. The hours during which the State Offices and the Washington Office are open to the public for the filing of documents and inspection of records are from 10 a.m. to 4 p.m., standard time or daylight saving time, whichever is in effect at the city in which each office is located.

Sec. 1821.2–2(d) Any document required or permitted to be filed under the regulations of this chapter, which is received in the State Office or the Washington Office, either in the mail or by personal delivery when the office is not open to the public shall be deemed to be filed as of the day and hour the office next opens to the public.

(e) Any document required by law, regulation, or decision to be filed within a stated period, the last day of which falls on a day the State Office or the Washington Office is officially closed, shall be deemed to be timely filed if it is received in the appropriate office on the next day the office is open to the public.

* * * * *

★U.S.GPO:1986-0-491-441/54130

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